

QST

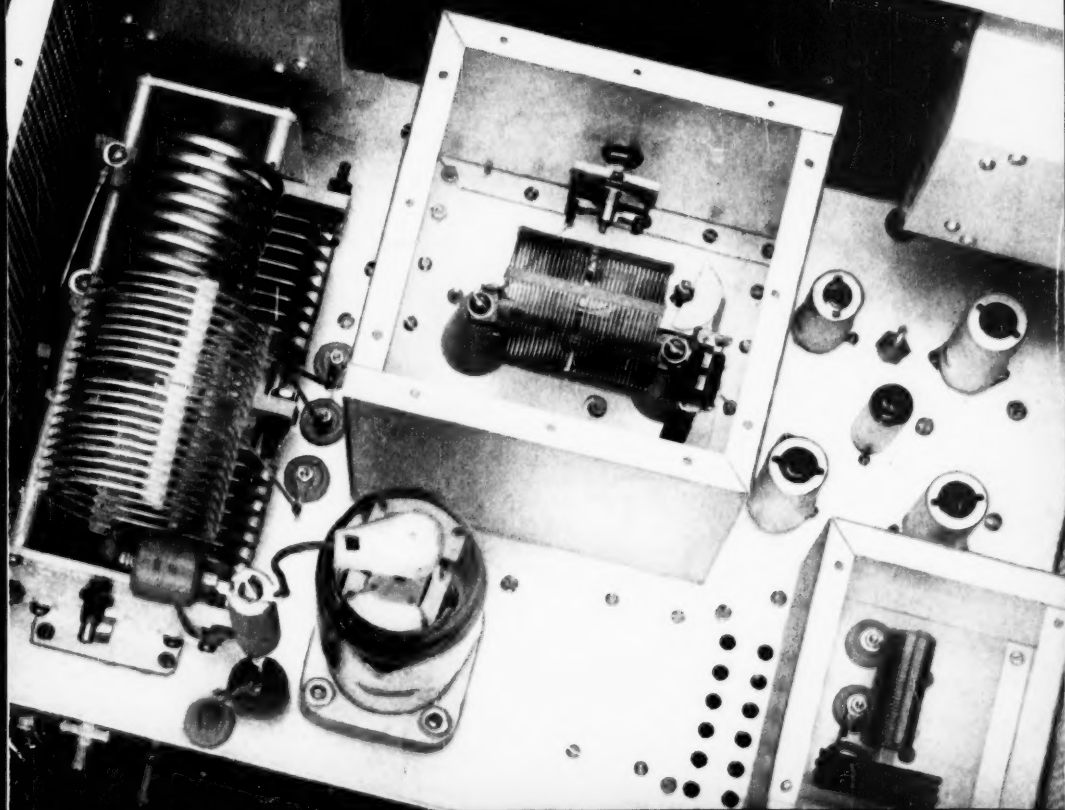
January 1954

40 Cents

45c in Canada

devoted entirely to

amateur radio



In This Issue—A 500-WATT MULTIBAND VFO TRANSMITTER

ULTRA COMPACT UNITS...OUNCER UNITS

HIGH FIDELITY... SMALL SIZE... FROM STOCK

UTC Ultra compact audio units are small and light in weight, ideally suited to remote amplifier and similar compact equipment. High fidelity is obtainable in all individual units, the frequency response being ± 2 DB from 30 to 20,000 cycles.

True hum balancing coil structure combined with a high conductivity die cast outer case, effects good inductive shielding.

Type No.	Application	Primary Impedance	Secondary Impedance	List Price
A-10	Low impedance mike, pickup, 50, 125/150, 200/250, or multiple line to grid	333, 500/600 ohms	50,000 ohms	\$16.00
A-11	Low impedance mike, pickup, 50, 200, 500, or line to 1 or 2 grids (multiple alloy shields for low hum pickup)	50, 200, 500	50,000 ohms	18.00
A-12	Low impedance mike, pickup, 50, 125/150, 200/250, or multiple line to grids	333, 500/600 ohms	80,000 ohms overall, in two sections	16.00
A-14	Dynamic microphone to one or two grids	30 ohms	50,000 ohms overall, in two sections	17.00
A-20	Mixing, mike, pickup, or multiple line to line	50, 125/150, 200/250, 333, 500/600 ohms	50, 125/150, 200/250, 333, 500/600 ohms	16.00
A-21	Mixing, low impedance mike, 50, 200/250, 500/600 pickup, or line to line (multiple alloy shields for low hum pickup)	50, 200/250, 500/600	50, 200/250, 500/600	18.00
A-16	Single plate to single grid	15,000 ohms	60,000 ohms, 2:1 ratio	15.00
A-17	Single plate to single grid 8 MA unbalanced D.C.	As above	As above	17.00
A-18	Single plate to two grids	15,000 ohms	80,000 ohms overall, 2:3:1 turn ratio	16.00
A-19	Single plate to two grids 8 MA unbalanced D.C.	15,000 ohms	80,000 ohms overall, 2:3:1 turn ratio	19.00
A-24	Single plate to multiple line	15,000 ohms	50, 125/150, 200/250, 333, 500/600 ohms	16.00
A-25	Single plate to multiple line 8 MA unbalanced D.C.	15,000 ohms	50, 125/150, 200/250, 333, 500/600 ohms	17.00
A-26	Push pull low level plates to multiple line	30,000 ohms plate to plate	50, 125/150, 200/250, 333, 500/600 ohms	16.00
A-27	Crystal microphone to multiple line	100,000 ohms	50, 125/150, 200/250, 333, 500/600 ohms	16.00
A-30	Audio choke 250 henrys \Rightarrow 5 MA 6000 ohms D.C. 65 henrys \Rightarrow 10 MA 1500 ohms D.C.			12.00
A-32	Filter choke 60 henrys \Rightarrow 15 MA 2000 ohms D.C. 15 henrys \Rightarrow 30 MA 500 ohms D.C.			10.00



TYPE A CASE
1 1/2" x 1 1/2" x 2" high

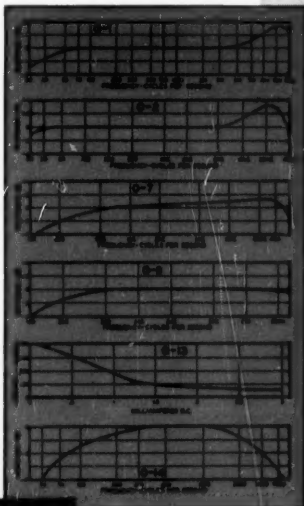
UTC OUNCER components represent the acme in compact quality transformers. These units, which weigh one ounce, are fully impregnated and sealed in a drawn aluminum housing 3/8" diameter... mounting opposite terminal board. High fidelity characteristics are provided, uniform from 40 to 15,000 cycles, except for 0-14, 0-15, and units carrying DC which are intended for voice frequencies from 150 to 4,000 cycles. Maximum level 0 DB.



OUNCER CASE

3/8" Dia. x 1 1/8" high

Type No.	Application	Pri. Imp.	Sec. Imp.	List Price
0-1	Mike, pickup or line to 1 grid	50, 200/250, 500/600	50,000	\$14.00
0-2	Mike, pickup or line to 2 grids	50, 200/250, 500/600	50,000	14.00
0-3	Dynamic mike to 1 grid	7.5/30	50,000	13.00
0-4	Single plate to 1 grid	15,000	60,000	11.00
0-5	Plate to grid, D.C. in Pri.	15,000	60,000	11.00
0-6	Single plate to 2 grids	15,000	95,000	13.00
0-7	Plate to 2 grids, D.C. in Pri.	15,000	95,000	13.00
0-8	Single plate to line	15,000	50, 200/250, 500/600	14.00
0-9	Plate to line, D.C. in Pri.	15,000	50, 200/250, 500/600	14.00
0-10	Push pull plates to line	30,000 ohms plate to plate	50, 200/250, 500/600	14.00
0-11	Crystal mike to line	50,000	50, 200/250, 500/600	14.00
0-12	Mixing and matching	50, 200/250	50, 200/250, 500/600	10.00
0-13	Reactor, 300 Mhs - no D.C. 50 Mhs - 3 MA D.C.		6000 ohms	10.00
0-14	50:1 mike or line to grid	200	1/2 megohm	14.00
0-15	10:1 single plate to grid	15,000	1 megohm	14.00



FOR THAT STEP UP

—in power
—in all-around
performance

—be thrifty!

Use the GL-811-A!



73% more
CW input

260 w,
one
GL-811-A

150 w,
two 807's



EVER consider the extra value in a GL-811-A triode? It has 73% more CW input than *two* 807's (cost is approximately the same)—or 260 w against 150 w. Phone-input superiority also is substantial—175 w against 120 w, or up 46%.

Second, you can't beat the low-cost GL-811-A for versatility! Ratings at right tell a story of performance with a wallop in both r-f work and modulator service . . . plus single-sideband transmission, in which amateurs are showing lively interest.

G-E Ham News, Sept.-Oct., 1952, described, with construction details, an SSB final powered with a GL-811-A. Here is a linear amplifier that will put you on the air with a 200-w signal.

Price the GL-811-A at your G-E tube distributor's! It's a real economy approach to extra power and performance. *Tube Department, General Electric Company, Schenectady 5, New York.*

POWER RATINGS (ICAS)

Maximum input, Class C CW	260 w
Maximum input, Class C phone	175 w
Maximum output, Class B modulator service	340 w (2 tubes)
Peak output, Class B r-f linear, in SSB speech transmission	200 w

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With ALL the Features Packed in Half the Size



It scarcely seems possible now, but the original Mallory UHF Converter, model TV101, was first put into production almost 9 months *before* the initial commercial UHF TV station began telecasting. Yet, this same Converter continued to be built without major circuit change for 2 solid years.

Call it genius, or call it luck . . . the TV101 design has been fabulously successful both as a UHF Converter and as an outstanding example of the sensible and far-sighted engineering abilities of the Mallory research organization.

Now, however, as many of you already know, the TV101 design has been retired in favor of a new UHF Converter called the Mallory "88". The Mallory "88" UHF Converter is a product of the same practical imagination which produced the TV101, and incorporates the same well-known tuning characteristics with the added attraction of a much smaller and more compact cabinet.

Mallory distributors are now featuring the new "88" in UHF TV territories everywhere and will be pleased to show this new model to you. In the meantime, we have listed the important physical and electrical characteristics of the "88" at right as advance information prior to your next visit to your Mallory distributor.

Tuning Range: 470-890 Mc. continuous

Tube Complement: 6AF4/
6T4 OSC.; 6CB6 I-F; 1N72
NTAL

Front End Circuitry: 3-tuned
circuits on all channels

I-F Output: VHF channels
5 or 6

Input & Output Impedances:
300 ohms

Ant. Changeover: 3 position
panel switch

Power Supply: Transformer
and selenium rectifier

Cabinet Dimensions: 7½"
W x 4½" D x 5¾" H

Weight: 3¼ lbs.

P. R. MALLORY & CO. Inc.
P. O. Box 1558
INDIANAPOLIS 6 INDIANA

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MALLORY

QST

JANUARY 1954

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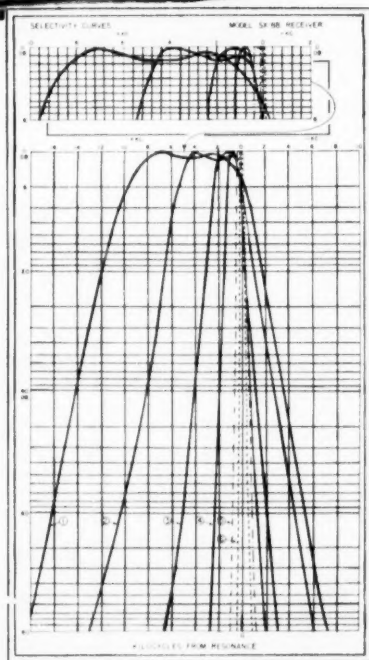
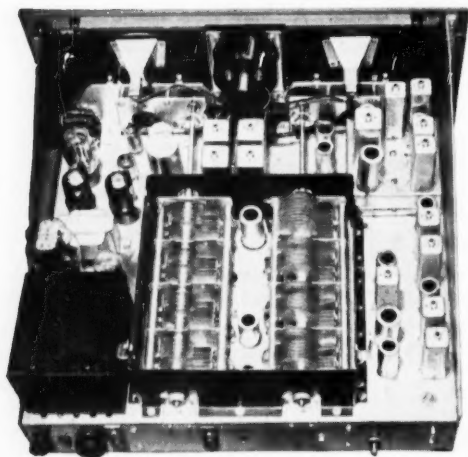
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2. Full precision gear drive for main and band spread tuning.
3. Six position Band Width Control (selectivity) from 250 cycles to 10 kc.
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5. Exhalted B. F. O. for tops in single side band reception.
6. Buffer amplifier in B. F. O. circuit.
7. Antenna trimmer.
8. Amplified and delayed A. V. C.
9. Built-in 100 kc calibration crystal.
10. Second conversion oscillators crystal controlled.
11. Inertia tuning (fly wheels both dials).
12. Full frequency coverage from 535 kc to 33 mc.
13. Calibrated electrical band spread 160, 80, 40, 20, 15, 11, and 10 meters.
14. Logging scales on each tuning shaft.
15. Dial locks on each tuning shaft.
16. Tuning dial indicators resettable from front panel for maximum calibration accuracy.
17. Auxiliary A.C. socket on rear of chassis.
18. Illuminated band-in-use indicator.
19. Illuminated S meter.
20. Dual S meter calibration S units and microvolts.
21. Auxiliary power socket plus .6 amps at 6.3 volts and 10 ma at 150 volts for accessories.
22. Standard 8 $\frac{3}{4}$ " by 19" panel for rack mounting if desired.
23. 50 kc i.f. output jack via cathode follower for teletype converter, etc.
24. Five position response control (tone control).
25. Two r.f. stages (Bands II to VI).
26. 17 tubes plus voltage regulator, ballast tube and rectifier.
27. Automatic noise limiter circuit.
28. Phono Jack.
29. Audio output transformer for 3.2, 8, 500/600 ohm loads.
30. Fuse for overload protection.
31. Auxiliary sensitivity control permits monitoring of local transmissions in standby position.

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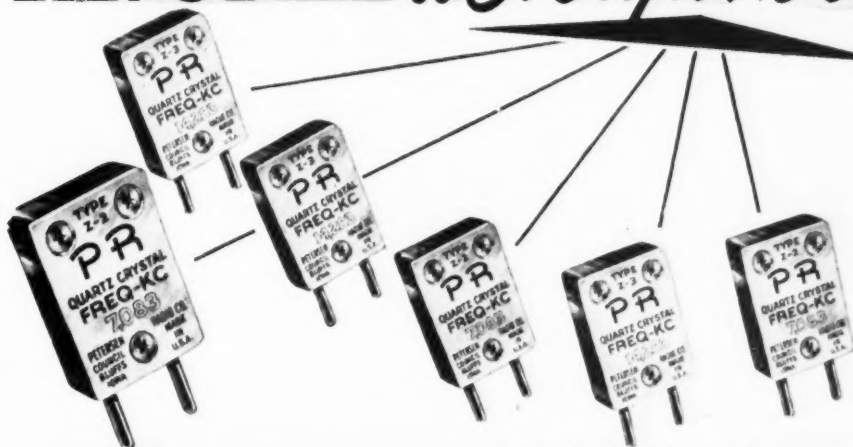
Reports Invited. All amateurs, especially League members, are invited to report station activities on the first of each of the preceding months directly to the S.C.M., the administrative ARRL official elected by the members in each Section. Club reports are also desired by S.C.M. for inclusion in QST. **All ARRL Field Organization appointments** are limited to qualified League members. These include QST, OES, OPS, OO and OBS. Also, where vacancies exist, desire applications for SFC, FC, RM and PAM. In addition to station and leadership appointments for Members, amateurs in the United States and Canada are invited to join the Amateur Radio Emergency Corps (ask for Form 7).

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THE AMERICAN RADIO RELAY LEAGUE, INC.,

is a noncommercial association of radio amateurs, bonded for the promotion of interest in amateur radio communication and experimentation, for the relaying of messages by radio, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

It is an incorporated association without capital stock, chartered under the laws of Connecticut. Its affairs are governed by a Board of Directors, elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial and no one commercially engaged in the manufacture, sale or rental of radio apparatus is eligible to membership on its board.

"Of, by and for the amateur," it numbers within its ranks practically every worth-while amateur in the nation and has a history of glorious achievement as the standard-bearer in amateur affairs.

Inquiries regarding membership are solicited. A bona fide interest in amateur radio is the only essential qualification; ownership of a transmitting station and knowledge of the code are not prerequisite, although full voting membership is granted only to licensed amateurs.

All general correspondence should be addressed to the administrative headquarters at West Hartford, Connecticut.



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5824 N. W. 58th St., Oklahoma City 12, Okla.

"It Seems to Us..."

THE YEAR IN REVIEW

We think it a good idea to pause, now and then, to take stock of amateur radio's progress and trends. The year end being an appropriate such time, as 1953 approaches its final days let us have the highlights of the year march quickly across this page.

Amateur radio maintained its continued growth during 1953, fast enough to be encouraging, yet slow enough to permit easy assimilation of the newcomers. The amateur body totaled something on the order of 114,000. (Actually, an inspection of FCC figures would indicate a decrease compared to a year ago, but this erroneous conclusion results from the fact that during the year a good start was made toward eliminating the double-count and other factors which inflated our totals during the previous two years.) FCC got some temporary help at midyear, permitting it to get completely up to date on ticket issuance and saving countless chewed fingernails on the part of newcomers. With the Advanced Class license no longer available, in 1953 there was practically no upgrading in proficiency as measured by progression to higher license classes; interest in the Amateur Extra was practically nil.

Regulationwise, advanced license requirements for the 75- and 20-meter voice bands were tossed out the window; new voice bands at 40 and 15 meters were opened to all classes; Novices got some relief from overcrowding with new assignments in the 40- and 15-meter bands, the latter replacing a previous 11-meter segment; all low-frequency c.w. bands were opened to F-1 emission for radioteletype purposes; the channel calling-and-answering idea caused the rumpus of the year, and soon was dropped cold; emergency regulations were revised to meet practical needs; the proposal to abolish distinctive call signs in special cases was dismissed. At year end there were pending proposals to conduct Novice and Technician exams by mail only, and to reduce to 50 miles the 125-mile limits for other mail examinations; and to open 21-Mc. for maritime mobile. "Conelrad" (wartime radio security) regulations for amateurs were in prospect.

Operating activities continued at as high a level as could be expected under present propagation conditions (and in some cases TVI problems). DX ardor was down a bit, but

Field Day was again the biggest ever, and in November previous SS records fell by the wayside. A Governors-to-President relay was completed successfully in January. Several tornadoes found amateur radio ready, as always, to provide emergency communications in time of disaster; they were only the highlights of another year of excellent performance in this field.

In TVI matters, again perhaps the subject of greatest concern throughout the year, the developments were both heartening and apprehensive. Color reared its polychrome head, but the situation was met head on by a joint amateur-industry committee aimed at providing necessary precautions; if industry takes its own advice, the problem need not become formidable. Dual-conversion channel strips, with too ravenous a frequency appetite, became a headache for 2-meter operators; the League served notice that this reversion to the dark ages of design was industry's problem, not the amateurs'. TVI committees numbered 300, and in nearly every community were labeled highly successful. The ARRL "TVI wagon" staged elaborate demonstrations for amateurs and servicemen in more than 30 major cities, completing coverage of practically every area in the eastern half of the country with low-band channels in operation.

League membership continued its steady growth. Full (licensed amateur) membership reaching the highest figure in history. *QST* was bigger and, measured by comments from the field, even better; the *Handbook* and most other ARRL publications outsold 1952; the financial statement for 1953 will show the highest gross income and outgo in ARRL's 40-year history. Houston amateurs played host to more than a thousand participants in the National Convention in July. Philip S. Rand, W1DBM, won the first annual ARRL Merit Award for his contributions to the TVI-elimination program. The first transistor rigs were set up and operated by hams. Two pioneer amateurs in Washington accomplished the amazing feat of bouncing a ham signal off the moon. Interest in s.s.b. continued to grow; amateur TV showed increasing signs of activity.

All this adds up, it seems to us, to a busy year and a progressive one. The past record looks good. Whether we make the future even better is up to us.

A Happy New Year

To Hams Everywhere

— The ARRL Hq. Gang

Strays

You've probably been reading about "Radio Jim Creek," our Navy's new 1.2-megawatt \$14,000,000 communications station built in a secluded part of the Cascade Mountains of north-west Washington state. The extremely long wavelength and unprecedented power of this installation will enable its transmissions to reach



A bird's-eye view through the steel framework of one of the 290-foot summit-ridge antenna towers of Radio Jim Creek. The transmitter building can be seen nestling in the valley between two 3900-foot mountains that serve as antenna masts.

naval units in every part of the world without the hindrance of propagation vagaries that beset lower-powered stations at higher frequencies. RCA Board Chairman Brig. Gen. David Sarnoff tapped out Radio Jim Creek's first official message on November 18, 1953, during "launching."

It happened again! John Nagel of St. Paul, Minn., was inadvertently issued the call sign WNØBT, the second instance of two-letter Novice licensing that has come to our attention. You are already too late to get a collector's-item QSL, however. John is now WNØQBT.

OUR COVER

Perhaps you were one of the many who worked W1JEQ on the second week end of the recent Sweepstakes contest. If so, you were participating in the christening of the 813 rig pictured on this month's cover. See page 11.

25 Years Ago
this month

January 1929

... This month's editorial heralds the arrival of 1929, a year in which amateurs will be called upon to assume greater responsibilities than ever before.

... "The Status of 28,000-Kc. Communication" is fully documented by Associate Technical Editor Ross A. Hull, featuring descriptions of prominent stations.

... T. C. Cooper, W1CGR, tells of a two-stage transmitter for 80 meters wherein the final doubles frequency to produce "A Crystal Note Without a Crystal."

... Relatively high efficiency with light loading is the goal sought by J. T. McCormick, W9BHR, in his experiments with "A Poor Man's M.O.P.A."

... "The Heterodyne Low-Frequency Generator," by J. E. Smith, details the function and construction of an indispensable piece of test apparatus for the ham shack.

... Allen B. DuMont, in "A Unique Method of Control by Means of Sound Waves," shows how a sound-operated circuit breaker will perform at the clap of one's hands.

... C. A. Briggs, W3CAB, solves a perplexing problem with "An Unusual Rectifier Cure," a circuit devised to eliminate excessive key sparking and blinking lights.

... Electrolytic rectifiers, self-rectification, keying and distributed coupling are subjects tackled in this month's Experimenters' Section Report.

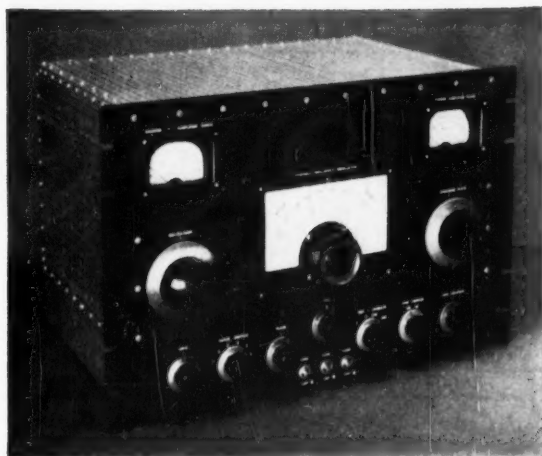
... Up-to-date news of far-flung expedition stations WSBS, WFAT, WFBT, CPA, sbJTC, WHDC, KDZ and VOQ appears in The Communications Department.

HAMS AT HEADQUARTERS

W1AW, ARRL Headquarters Station

The following calls and personal sines belong to members of the Headquarters gang:

W1BDI	F. E. Handy, "fh"
W1BUD	A. L. Budlong, "bud"
W1CEG	H. M. McKean, "mac"
W1DF	George Grammer, "gg"
W1DX	Byron Goodman, "by"
W1FWH	W. E. Bradley, "wb"
W1HDQ	E. P. Tilton, "ed"
W1HCP	L. G. McCoy, "lew"
W1JEQ	C. V. Chambers, "ve"
W1JMY	J. A. Moskey, "joe"
W1LVQ	John Huntoon, "jh"
W1NJM	George Hart, "geo"
W1QIS	Murray Powell, "mp"
W1TS	D. H. Mix, "don"
W1VG	L. A. Morrow, "pete"
W1VMW	Rod H. Newkirk, "nk"
W1WFO	R. L. White, "bob"
W1WPR	C. R. Bender, "cr"
W1WRJ	A. Murray Rommé, "mr"
W1YYM	Ellen White, "in"
W1ZCS	Marie L. Page, "rie"
W1ZDP	Phil Simmons, "phil"
W1ZIB	Ann Furr, "ann"
W1ZID	Anne Welsh, "aw"
W1ZIK	Jennine Parent, "jean"
W1ZIM	Miriam Knapp, "kp"
W1ZJE	Lillian M. Salter, "lil"
W2RTZ/1	Hope Plummer, "cp"



The panel of the 813 transmitter is 12 $\frac{1}{4}$ by 19 inches. Windows for the grid and the plate meters are at the upper left- and right-hand corners directly above the excitation and the amplifier plate controls, respectively. The VFO vernier dial is centered above oscillator handset capacitor, C_2 . Tuning knobs for C_4 , S_3 , C_5 , S_1 , S_2 and C_{10} are in line from left to right across the panel just above the toggle-type a.c. line switches. Perforated aluminum is used to enclose the transmitter.

Three-Control Six-Band 813 Transmitter

Multiband Tanks in a 500-Watt High-Frequency Rig

BY C. VERNON CHAMBERS,* W1JEQ

THE prime considerations in the design of the transmitter shown in the photographs were power, operating convenience, TVI, safety and appearance. Use of a 500-watt output stage leaves little doubt about the power angle. Operating convenience is placed at a nearly maximum level by the inclusion of a built-in VFO and the complete elimination of plug-in coils. To change bands, it is only necessary to retune three homemade multicircuit tuners and readjust the output coupler. There is only one r.f. switch and this need be thrown only when shifting between high- and low-frequency bands. Furthermore, the unit takes up no more space than the average receiver. In other words, it's a compact layout that can rest right on the operating table. TVI has been handled by employing all of the wiring, by-passing and shielding methods that have become standard practice during the last year or two. Safety is automatically taken care of by the elimination of plug-in coils, and the fact that the transmitter need never be opened during the normal course of operation. The neat commercial appearance is obtained by a carefully planned panel and chassis layout and the use of readily available panel markings.

Circuit

As the circuit of Fig. 1 shows, the VFO uses a 5763 in a Clapp circuit operating in the 3.5-Mc. region. The total usable frequency range of 3370 to 4000 kc. is split into three bandspread ranges, tuned by C_1 , which is fitted with a calibrated dial. These ranges are selected

by proper setting of C_2 . The principal range covers 3500 to 3750 kc. This range is used for all operation except in the 11-meter band and the 75-meter 'phone band. By adjusting C_2 to a higher capacitance, the frequency range is lowered to include 3370 kc. for 11-meter operation; with C_2 set at a lower capacitance, the tuning range is shifted to cover 3750 to 4000 kc. for 75-meter 'phone work. The oscillator screen voltage is regulated by the 0A2 VR tube.

The oscillator circuit is followed by two isolating stages. The first is a 6C4 connected as a cathode follower, which is very effective in reducing reaction on the oscillator by subsequent stages. Good oscillator keying for break-in is a result, even at 28 Mc. Since the output of the cathode follower is quite small, it is followed by a 5763 in an amplifier fixed-tuned in the 3.5-Mc. region.

Frequency multiplying to reach the higher-frequency bands is done in the next two stages,

• Here is a package of power for 3.5 through 28 Mc. that has no more tuning controls than many low-power, one- or two-band jobs. It's a *break-in* layout, complete with VFO and output-coupling circuits. The use of simple homemade multiband tuners — there are only three of them — has eliminated the need for complicated r.f. switching circuits and dangerous plug-in coils. And the rig can be moved from band to band in not much more time than it takes to note the frequency change in the logbook.

* Technical Assistant, QST.

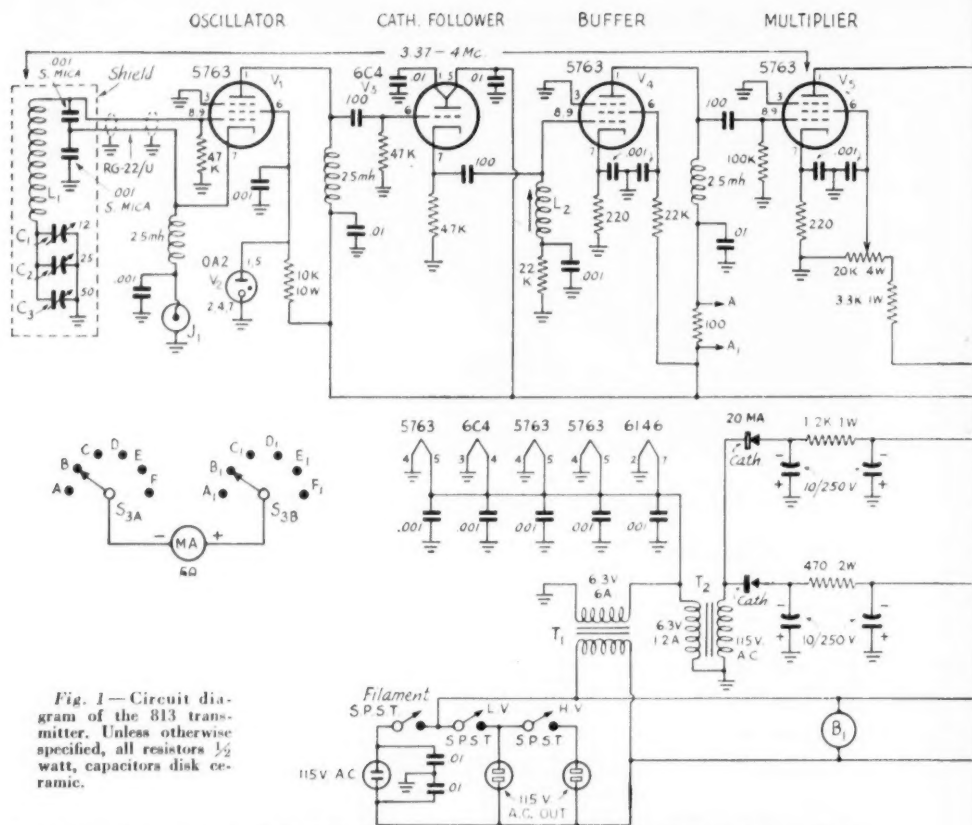


Fig. 1—Circuit diagram of the 813 transmitter. Unless otherwise specified, all resistors $\frac{1}{2}$ watt, capacitors disk ceramic.

- C₁—Approx. 12- μ f. variable (Cardwell PL-6001 rear stator plate removed, rear rotor plate bent; see text).
 C₂—25- μ f. variable (Cardwell PL-6002).
 C₃—50- μ f. variable (Cardwell PL-6009).
 C₄, C₅—140- μ f.-per-section variable (Cardwell PL-6043).
 C₆—0.001- μ f. disk, 1000 volts.
 C₇, C₈—500- μ f. ceramic, 20,000 volts (Sprague 20DK-T5).
 C₉—200- μ f.-per-section variable (Johnson 200DD35).
 C₁₀—365- μ f. variable (Cardwell PL-7006).
 C₁₁—560- μ f. disk, 6000 volts (Centralab DD60-561).

the first using a 5763, while the second employs the larger 6146 to drive the final amplifier. These two stages are tuned with multiband tuners—circuits which have a tuning range that includes all necessary bands. Thus no switching or plug-in coils are needed.

To assure complete stability without the possible necessity for special precautions that would complicate the circuit and its adjustment, neither of these two stages is operated as a straight amplifier, except on 80 meters. Frequency is doubled in the 6146 stage for output on 40, 20 and 10 meters, and tripled for output on 15 meters. The 5763 stage is operated at 3.5 Mc. for 80- and 40-meter output, doubles to 7 Mc. for 20- and 15-meter output, and quad-

- L₁—35 μ h.—34 turns No. 16, $2\frac{1}{2}$ inches long, 2 inches diam. (B & W 80-BCL with plug-in base and link removed).
 L₂—69 to 134 μ h.—93 turns No. 36 enam., $1\frac{1}{2}$ inch long, $\frac{1}{2}$ inch diam.; close-wound on National XR-50 slug-tuned form.
 L₃—2.6 μ h.—31 turns No. 20, $1\frac{1}{2}$ inches long, $\frac{1}{2}$ inch diam. (B & W 3003).
 L₄—5.3 μ h.—30 turns No. 20, $1\frac{1}{4}$ inches long, $\frac{3}{4}$ inch diam. (B & W 3011).
 L₅—1.5 μ h.—11 turns No. 16 enam., $1\frac{3}{16}$ inch long, $\frac{3}{4}$ inch diam.

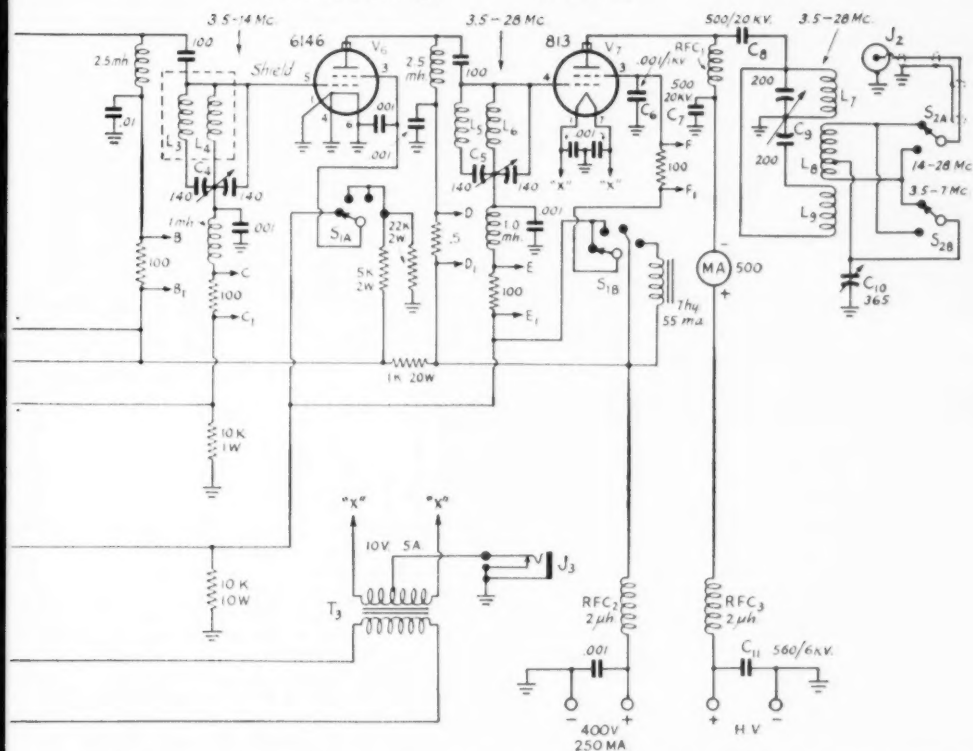
riples to 14 Mc. for 10-meter output. Excitation to the final is adjusted by the potentiometer in the screen circuit of this stage.

The 813 in the final amplifier also uses a multiband tuner to cover all bands. This stage is always operated as a straight amplifier, and should be entirely stable without neutralization. The only switching necessary is in the output link circuit in changing between high- and low-frequency bands. S_{2B} of this circuit shorts the bottom section of L₅ at 3.5 and 7 Mc. and cuts out the top part of the coil at 14 Mc. and above. Loading is adjusted by C₁₀.

A 50-ma. meter may be switched to read plate current in the exciter stages, and grid current in the driver and final-amplifier stages. Provision

MULTIPLIER-DRIVER

AMPLIFIER



L_6 —8.9 μ h.—29½ turns No. 20, 17½ inches long, 1 inch diam. (B & W 3015).

L_7 —5.1 μ h.—10 turns No. 12, 15½ inches long, 2½ inches diam.; see text. (B & W 3905-1).

L_8 —4.2 μ h.—9 turns No. 12, 13½ inches long, 2½ inches diam., tapped at 8th turn; see text. (B & W 3905-1).

L_9 —1.6 μ h.—7 turns ¼-inch copper tubing, 2½ inches long, 2 inches diam.

B_1 —Blower and motor, 115 v. a.c. (available from Allied Radio, Chicago, catalog No. 72-702 motor and 72-703 fan).

J_1 —Key jack—'phono input jack.

J_2 —Coaxial cable connector.

J_3 —Midget closed-circuit jack.

for reading 813 screen-grid current is also made. The ½-ohm resistor in the 6146 high-voltage lead multiplies the meter-scale reading by three. A separate 500-ma. meter is used to check plate current to the 813.

The two-circuit rotary switch, S_1 , is used to bias the screens of the 6146 and 813 negative while tuning up the preceding stages and setting the VFO to frequency. In the first position, both screens are biased; in the second position, only the 813 screen is biased, while positive voltage from a voltage divider is applied to the screen of the 6146 so that this stage may be tuned up. In the third and fourth positions, positive voltage is applied to both screens, but in the last position it is applied to the 813 screen through an audio

RFC_1 —R.f. choke, 129 turns No. 26 d.c.c., 3½ inches long, 11/16 inch diam., wound on Millen No. 31004 ceramic stand-off insulator.

RFC_2 , RFC_3 —2- μ h. r.f. choke (National R-60).

S_1 —2-pole 5-position phenolic selector switch, non-shorting (Centralab 1405).

S_2 —2-pole 5-position seatite selector switch, used as d.p.d.t. (Centralab 2505).

S_3 —2-pole 6-position phenolic selector switch (Centralab 1411).

T_1 —6.3-volt 6-amp. filament transformer (Triad F-18A).

T_2 —6.3-volt 1.2-amp. filament transformer (Triad F-14X).

T_3 —10-volt 5-amp. fil. transformer (Triad F-23U).

choke so that the stage may be screen-plate modulated.

Two 20-ma. rectifiers are included in the unit, to supply fixed bias to the 6146 and 813, so that the plate currents will be cut off during keying intervals. Both rectifier systems operate from a single 6.3-volt filament transformer connected in reverse. The bias transformer, T_2 , is operated from the 6.3-volt winding of the filament transformer, T_1 .

Two a.c. outlets are provided for connecting the primaries of external high- and low-voltage supplies into the control circuit consisting of three toggle switches. B_1 is the ventilating blower that starts operating as soon as the filament switch is closed. This is virtually a

necessity with so much power confined in a small space. The jack, J_3 , provides a means of keying the final amplifier, rather than the oscillator, or it may be used for the connection of an external cathode modulator.¹

Construction

Most of the constructional details will be evident from the photographs and their captions. However, construction will be simplified by doing the basic operations in logical order. Start with the layout of parts that mount on the front wall of the chassis. Do not remove the wrapping from the chassis for the time being, as the paper covering provides a convenient surface on which to make location marks. Start with a vertical line at the center of the front wall of the chassis, and then add three additional lines, each $2\frac{1}{8}$ inches apart, on each side of the center guide. Now, mark the positions of the ten controls that are chassis-mounted. The VFO handset control is directly above the center toggle switch, and is far enough down from the top of the chassis to permit use of a right-angle drive between the knob and the variable condenser (to be mounted later on). The spacing between toggle switches is 1 inch, and the six controls that flank the center line are centered on their guide lines already drawn. Next, drill a small hole—a No. 35 does very nicely—through each of the ten location points. This will permit the chassis to be used as a template during the panel-layout stages of construction.

The layout of components on the rear wall of the chassis is next on the list. Actual placement of parts is not critical, and easily can be duplicated after brief study of the rear and bottom views of the transmitter.

The VFO tank subassembly may be constructed at this time. Remove the top and bottom covers from the square box and then mark the mounting position for C_1 on the front wall—centered $2\frac{1}{8}$ inches up from the bottom. Screw the bottom cover in place and mark

mounting-hole locations for C_2 , C_3 and L_1 . Do not drill any holes at the moment. C_2 should be centered in the bottom of the box with its shaft vertical, $1\frac{1}{8}$ inches back from the front edge. C_3 should be similarly mounted to the left of C_2 . The 2-inch isolantite stand-off insulators that support L_1 should be located so as to allow the coil to be placed at the exact center of the bottom plate. The point where the RG-

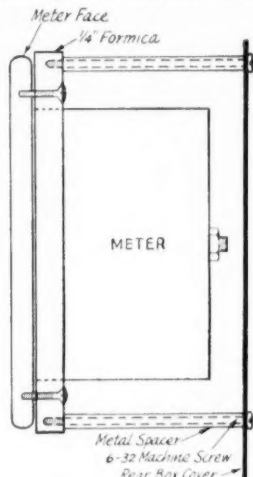
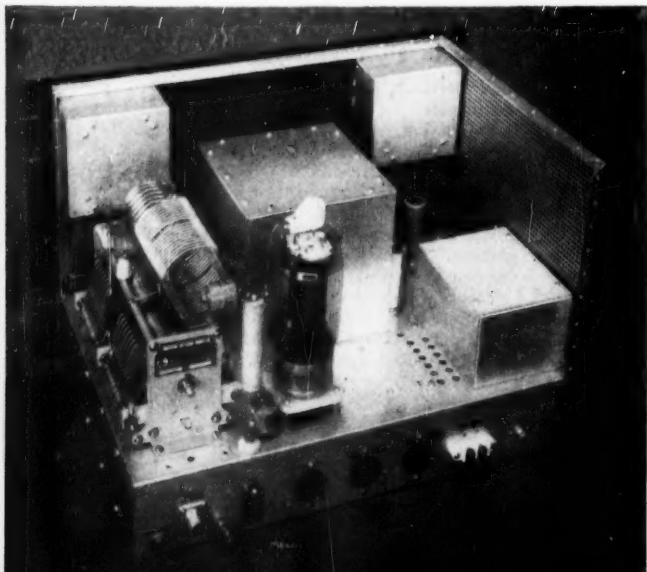


Fig. 2—The 3-inch square meters are mounted on the covers of the boxes with four spacers.

22/U cable will leave the compartment should be at the rear left-hand corner of the box.

The box is mounted on the chassis with machine screws around the bottom lip of the box and the bottom cover. When the transmitter was first constructed, screws were used only at the original cover-mounting holes. While no difficulty was encountered on higher-frequency bands, the keyed signal was chirpy with serious a.c. modulation on 80 meters caused, apparently, by feed-back from the adjacent final tank when

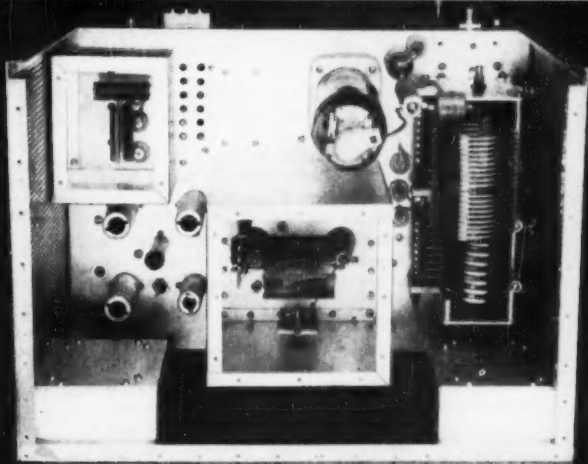


Rear view of the 813 transmitter. L_7 , L_8 are mounted on top of the amplifier tank capacitor, C_9 . The 813 socket is mounted on $\frac{1}{2}$ -inch metal posts directly over a $2\frac{1}{4}$ -inch diameter chassis hole. C_7 is near the high-voltage feed-through at the rear of the chassis, and supports the cold end of RFC_1 . C_8 is mounted between the top end of RFC_1 and a No. 12 wire lead that connects to the plate end of L_7 . Holes through the chassis to the right of the 813 provide ventilation for the 6146 below deck. J_3 , J_2 and a ground terminal are to the left of the high-voltage terminal on the rear wall of the chassis. Next in line, to the right, are the a.c. receptacles, the low-voltage input terminals and the key jack, J_1 .

QST for

¹Gardner, "The Simplest Modulator," QST, Sept., 1933.

View of the 813 transmitter with the outer shielding and the covers for the shielded compartments opened for inspection. The metal box near the center is $6 \times 6 \times 6$ inches and houses C_1 , C_2 , C_3 , L_1 and the silver-mica capacitors of the oscillator grid circuit. The aluminum cases for the meters are $2 \times 4 \times 4$ inches. The $3 \times 4 \times 5$ -inch box in the upper left-hand corner of the chassis provides shielding for L_3 and L_4 . The arrangement of tubes to the left of the oscillator enclosure has V_3 and V_4 to the right and left, respectively, of the tuning slug for L_2 . The 0A2 is below and to the right of V_3 , and V_1 is at the upper right-hand corner of the group. Feed-through insulators to the right of the oscillator compartment carry leads between coupling coil, L_5 , and output switch, S_2 .



tuned to the same frequency as the VFO. There was also considerable dragging of the oscillator frequency with tuning of the final stage and even the antenna coupler. This was entirely cleared up by adding screws at 1-inch intervals around the bottom. The bottom contact with the chassis seemed to be considerably more important than the tightness of the top cover, but it would be well to use the same screw spacing on top as insurance. These additional holes, as well as those for the condensers, coil and coax, should now be marked and drilled with a No. 35 drill. The box should then be centered on the chassis, with its front edge $1\frac{13}{16}$ inches back from the front edge of the chassis. Using the bottom cover as a template, the holes should be duplicated in the chassis. Draw a square around the box and then set it aside. This will remind you to keep that area clear while the rest of the chassis layout is being worked.

The interior and the bottom views of the transmitter show how the components for V_1 through V_5 have been grouped at one corner of the chassis. After the sockets for these tubes, and L_2 , have been fitted into the layout, mounting holes should be provided for the amplifier tank capacitor, for C_7 , V_7 and the feed-throughs for the h.v. and output-coupling leads. The shaft for C_9 should be aligned parallel with and $2\frac{1}{4}$ inches in from the left end (rear view) of the chassis, and the rear end plate of the capacitor should be $1\frac{5}{8}$ inches in from the back edge of the chassis. Feed-through insulators for the link circuit are located in between C_9 and the oscillator compartment. The h.v. feed-through is at the rear edge of the chassis, directly above the h.v. safety terminal. The socket of V_7 is centered $2\frac{1}{4}$ inches from the rear edge of the chassis, and $6\frac{3}{4}$ inches from the end.

Aluminum brackets for the under-chassis construction should now be bent into shape. The one that supports T_1 and T_2 is $2\frac{7}{8}$ inches high, $4\frac{3}{4}$ inches long and has side and bottom lips for fastening to the chassis. The bracket for the 6146 has a $2\frac{1}{4}$ -inch section for the socket, and a

5-inch member that serves as a shield between the grid and the plate circuits of the driver. This bracket has a $\frac{1}{2}$ -inch hole at the rear corner that passes the lead between the grid prong of the tube socket and the stator terminal of C_4 . This bracket is placed with the long side $3\frac{1}{8}$ inches in from the right end (bottom view) of the chassis. A series of $\frac{1}{4}$ -inch ventilation holes for the 6146 should be drilled in the chassis before the bracket is bolted in place. The brackets for C_4 , C_{10} and S_2 , and the tubular spacers used to raise C_5 off the chassis should all have dimensions which allow the shafts of the controls to line up with the holes already marked on the front wall of the chassis. Before C_4 is permanently installed, mount three feed-through insulators in the chassis, just directly over the stator and the rotor terminals of the capacitor. These insulators will be used to support L_3 and L_4 (in the $3 \times 4 \times 5$ -inch box in the interior view) and for feeding leads between the coils and C_4 .

The next job is that of spotting mounting holes on the panel. Lay the panel face down on a bench or table, and then use the front walls of the chassis and the VFO shield as templates for marking holes for the condensers and switches. Allow the panel to overlap the bottom of the chassis by $\frac{3}{16}$ inch during this operation. Now, mark a hole for the shaft of C_9 , remove the chassis, and then measure off locations for the meters and the excitation control. The excitation control should balance with the shaft position for C_9 , and the centers of the meters should be above and in line with these last two controls. Now, drill mounting holes for the National SCN VFO and the National AM (used with C_9) dials, and then cut windows for the meters. These cut-outs should match the inside dimensions of the National type CFA chart frames. The mounting hardware for the frames is used to hold the meter boxes against the rear of the panel. Fig. 2 shows a method of subassembly that provides both d.c. insulation and r.f. shielding for the meters.

The holes in the VFO compartment and the

top of the chassis may now be enlarged to the proper size for the mounting screws and oscillator components. The holes in the front wall of the chassis should also be enlarged to accommodate the control shafts, and the panel holes reamed correspondingly. When performing this operation, allow for the use of panel bushings with the right-angle drive and C_{10} . Panel-bearing shaft assemblies are to be used with C_4 , C_5 and S_2 . In the final assembly, insulated shaft couplers must be used between the panel bearings and shafts of C_4 and C_5 .

Inductors L_7 - L_8 and L_9 should be mounted on C_9 before the capacitor is secured to the chassis. L_7 - L_8 is made from a length of B & W 3905-1 coil material. Clip the support bars at one end of the coil and unwind one full turn. Count off $10\frac{1}{4}$ turns and clip the winding *without* breaking the support bars. Bend the last quarter turn out from the body of the coil. This section of the assembly is L_7 . Completely remove the next $\frac{3}{4}$ turn—watch the bars. This leaves a $\frac{1}{4}$ -inch space between L_7 and the adjacent coil, L_8 . Count off 10 turns, remove the excess material and unwind the last full turn. Now solder heavy wire leads, approximately 6 inches long, to the inside end, and to the first turn (counted from the open end) of L_8 .

The bottom cover is removed in this view of the 813 transmitter. T_3 and the B_1 are on the wall at the left end of the $3 \times 12 \times 17$ -inch aluminum chassis. C_{10} , S_2 and the 7-hy. choke are at the lower left corner. Bias-circuit components for the final are to the left of the right-angle drive for C_2 . An aluminum bracket at the center of the chassis supports T_1 , T_2 and the 6146 biasing components. C_6 is mounted on metal pillars to the left of V_6 and C_4 is bolted to a bracket at the right of the tube. Below V_6 are the tube socket and plate r.f. choke for the oscillator. L_2 , located below the 6A2 socket, is flanked to the left and right by sockets and components for V_3 and V_4 . The 20-watt resistor, multiplier plate choke and the socket for V_5 form a triangle just below C_4 .

Tuning Chart for the 813 Transmitter

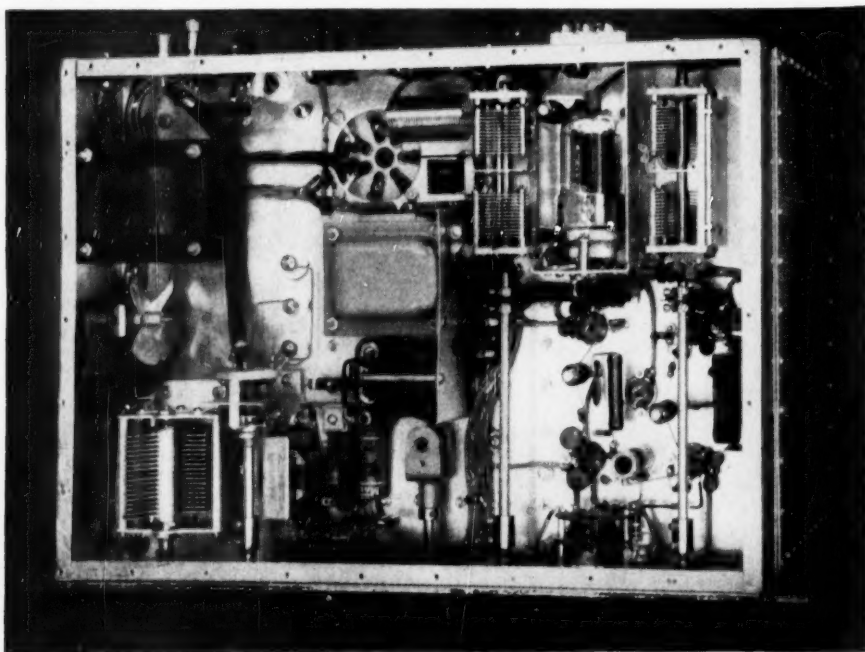
Output Band (Mc.)	C_4		C_5		C_6 Dial ²
	Dial ¹	Band (Mc.)	Dial ¹	Band (Mc.)	
5.6	8.8	3.5	6.1	3.5	77
7	8.8	3.5	0.5	7	9
14	1.5	7	9.5	14	82
21	1.5	7	3.7	21	26
27-28	4.7	14	1.8	28	7

¹ 10-division dial — 10 max. capacitance.

² 100-division dial — 100 max. capacitance.

Hold the coil assembly above the rear section of C_9 in a position similar to that shown in the rear view of the transmitter. Now adjust the length of the lead at the rear end of L_7 until it reaches the stator terminal at the back of C_9 . Bend the inside lead of L_7 over to the tubular support rod that runs the length of the capacitor, mark the intersection and then drill and tap the rod for a 6-32 machine screw. Place C_9 on the chassis and cut to length the three leads from L_8 to the coupling-circuit feed-throughs. Remove the coil-condenser assembly from the chassis and mount L_9 on $\frac{1}{2}$ -inch stand-offs, just to the front of L_8 .

(Continued on page 112)



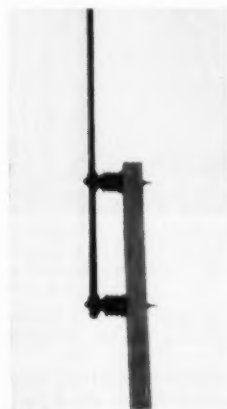
A Compact Beam for 40 and 20 Meters

"Switchable" Directivity with Vertical Elements

BY JAMES A. TURNER,* W9LI

THE antenna to be described here has evolved over the years in an effort to get the "mostest from the leastest." It won't bat in the same league with a three-element rotary on twenty, but it will produce a respectable DX signal both on twenty and forty meters and is still inconspicuous enough to avoid the notice of the followers of Uncle Milt. The sight of a big beam or a

• Not everyone is blessed with room enough for an "antenna farm," W9LI included, but it didn't prevent his rigging up an antenna system that gives him gain and directivity on two bands.



A close-up view of an element support.

tall pole seems to be enough to convince most TV fans that you are the cause of it all. In addition, this antenna is simple in construction and not too expensive, particularly if surplus relays and condensers are used. The top of a stepladder is high enough for work on this antenna.

The QTH at W9LI is unfortunate in having a surplus of shade trees. There is simply no room for a horizontal antenna. The only answer was to go straight up and use something vertical. So various vertical set-ups: ground planes, half-wave verticals, switchable parasitic beams, etc., have all been used in the past. The antenna presented here seems to have a somewhat lower angle of radiation than a single element and has none of the objections found in the parasitic set-up.

Basically, it consists of three 33-foot self-supporting elements set in an equilateral triangle 11 feet on a side, or approximately 0.15 wavelength

* 102 Monroe St., Elgin, Ill.

¹ Kraus, "Directional Antenna with Closely-Spaced Elements," *QST*, Jan., 1938.

The 20/40-meter beam at W9LI uses three vertical elements (the rear one is masked somewhat by a small tree). The tuning "doghouse" can be seen supported by a separate pole.

apart at twenty meters. Each element has its bottom end ten feet off ground. Any two elements may be fed 180 degrees out of phase on either twenty or forty meters, so that the antenna might be called a half-wave W8JK¹ on twenty and a quarter-wave W8JK on forty. The pattern is bidirectional and is switchable to three positions by means of relays, so that the full 360 degrees is fairly well filled in. The pattern is somewhat sharper on twenty than on forty but the directivity is still clearly defined on the latter, particularly on DX signals arriving at low angles. Signals arriving at high angles show little directivity but that is more or less true of all low-frequency beams. The gain is about 4 db. and the drop in the notch of the figure 8 pattern is about four S-points.

With this close spacing, the beam is fairly frequency sensitive. This is most pronounced on



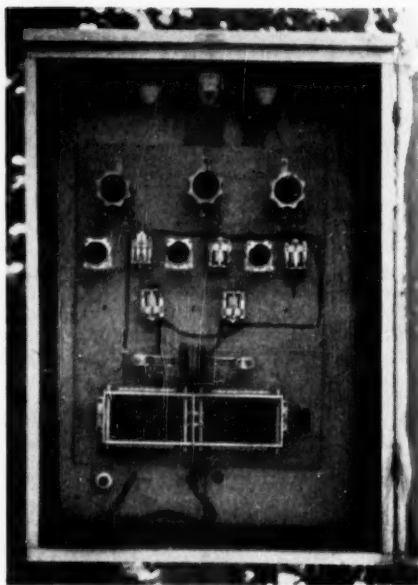
forty meters and perhaps seventeen feet or an eighth wave spacing on this band might be better, if room were available. However, over the c.w. portion of twenty and the first 100 kc. of forty little trouble is experienced.

Construction

Each element is of 61ST aluminum and is made up of six 6-foot pieces, starting at $1\frac{1}{2}$ inches in diameter and tapering to $\frac{3}{4}$ inch in $\frac{1}{4}$ inch steps. The wall thickness is 0.058 inch (17 Stubs gauge) and telescopes perfectly. The sections are held together with self-tapping screws. No guys are used and, although the tops of the elements move quite a little in a high wind, no trouble has been experienced in the several years that they have been in use.

Each element is supported on two stand-off insulators on a sixteen-foot 4 by 4. The stand-offs are two feet apart and the poles are set four feet in the ground. The whole arrangement is very easy to erect, and the elements are so light that one man standing on a stepladder can raise them into place. The stand-off insulators used here have U clamps through which the elements are slid into place and then tightened down. Undoubtedly, there are other mechanical arrangements that would serve just as well.

Another slightly shorter 4 by 4 was placed in the center of the triangle and a 20 by 24 by 10-inch "doghouse" mounted on it, with the feed-through insulators on the top of the box even with the bottom ends of the elements. A wire from each element was then run over to the feed-throughs. A tuning network is mounted in the doghouse,



The "doghouse" protects coils, condensers, and relays from the weather. The antenna leads are brought in through the top — feeder coax line and control wires run out the bottom.

and the 52-ohm coax line and the relay control cable run underground from the shack to the doghouse.

Referring to Fig. 1, relays K_4 and K_5 select the two elements to be fed. Relays K_1 , K_2 and K_3 short the series condensers when operating on twenty meters.

Tuning

Tuning up is not difficult and the easiest way is to use a remote field-strength meter. Here I use a simple lash-up consisting of an eight-foot dipole with a 1N34 crystal diode connected in the center. Output is taken off through two 2.5-mh. chokes and by-passed for r.f. A pair of wires about a hundred feet long run over to a 1-ma. meter at the tuning box.

Relays K_1 , K_2 and K_3 are closed, shorting the series condensers, and the beam is first tuned for twenty meters. C_4 sets the over-all resonant frequency. Then the loading coils L_1 , L_2 and L_3 are balanced so that the coil in each leg, plus the seven feet or so of wire from element to the tuning box, looks like 17 feet or a quarter wavelength at twenty meters. Under these conditions the elements are voltage-fed 180 degrees out of phase at their bases.

After everything is balanced on twenty so that the beam loads the transmitter equally no matter which pair of elements is selected, relays K_1 , K_2 and K_3 are opened, leaving the series condensers C_1 , C_2 and C_3 in the circuit, and we are ready to tune up on forty. C_4 is not touched when tuning

(Continued on page 118)

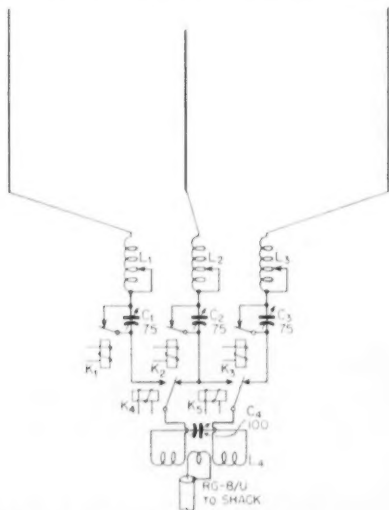


Fig. 1 — The circuit of the two-band beam.
 K_1 , K_2 , K_3 , K_4 , K_5 — Ceramic-insulated relay (Advance 2000-18).
 L_1 , L_2 , L_3 — 15 turns No. 14 wire wound on $2\frac{1}{2}$ -inch diam. ceramic form.
 L_4 — 6 turns No. 12 air-wound, $2\frac{1}{2}$ -inch diam.; link, 2 turns.

The A.M. Equivalent of Single Sideband

How To Compare the Two Types of Transmission

BY GEORGE GRAMMER,* WIDF

• There seems to be a common misconception about the power gain of single sideband over amplitude modulation, and it appears timely to throw a little light on the subject.

SEVERAL years ago Don Norgaard, W2KUJ, showed that it is possible to obtain an improvement of 8 times, or 9 db., by using single sideband instead of conventional amplitude modulation.¹ There are indications that this figure is being bandied about in a way that is entirely improper, and certainly not intended by the author of the article. Irreconcilables cry in their beer over it as giving single sideband a tremendous, and unfair, advantage over their cherished amplitude modulation. But although this may come as a shock, the reasons for the superiority of "sideband" as a method of amateur communication have to be looked for elsewhere, because the power gain in the way most fellows visualize it is largely a mirage.

Before taking this as a contradiction of Norgaard, let's see what it was he actually said. Here is a direct quote of the conclusion that was printed in italics in the article: "Single-sideband operation can give 9-db. signal-to-noise ratio improvement over amplitude modulation operating at the same peak power output." If you will study that statement carefully, you will see that it is not comparing powers as hams ordinarily think of them. It does not say that a 100-watt single-sideband signal is equivalent to an 800-watt a.m. signal, or that a kilowatt of a.m. is no better than 125 watts of s.s.b. Yet that is the sort of thing most hams have in mind when seeking a comparison between a.m. and s.s.b.

The answers are to be found in W2KUJ's article if you look for them. As a matter of practical operating, there are two things that have to be considered — the actual "talk power" of the signal, and the signal-to-noise ratio. The former is probably of more interest than the latter on low-frequency bands where receiver noise and the normal smooth background of atmospheric noise are relatively unimportant compared with interference. The signal-to-noise ratio is the important consideration where interference is not a factor but where what is commonly called "receiver noise" represents the limiting element in communication.

In order to evaluate these things, we have to agree on language. What is a "100-watt single-

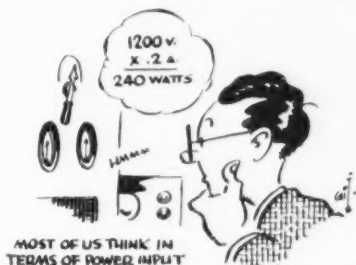
* Technical Editor, QST.

¹ Norgaard, "What About Single Sideband?", QST, May, 1948.

sideband transmitter," and what is a "100-watt a.m. transmitter?"

Some Definitions and Conditions

By tradition, regulation and convenience most of us are conditioned to thinking in terms of power input. (How else can we have "kilowatt" transmitters, legally?) A "100-watt a.m. transmitter" is understood to be one running 100 watts input with plate modulation. Its actual carrier output might be anywhere from 50 to 80 watts, depend-



ing on how good the operator is at getting efficient operation. However, it is the r.f. power output, not the d.c. plate input, that makes the impression on a distant receiver. It is obviously impossible to base any useful comparisons on power input, in view of the variability of the output. For present purposes, then, we will assume that a 100-watt a.m. transmitter is one having a carrier output power of 100 watts, and capable of 100 per cent modulation with good linearity. The d.c. plate input might be anywhere between 125 and 200 watts, with the probable figure in the neighborhood of 150.

How most sidebanders rate their linear amplifiers is something of a question, at least to this writer, but (always excepting compliance with FCC requirements) the practice of rating such amplifiers by d.c. input is about as meaningful as rating a Class B modulator by d.c. input. The thing that counts is the peak power output that it is possible to obtain without going beyond linearity. The relationship between this and the d.c. power input is rather vague, since it depends on the class of operation — A, AB₁, AB₂, or B — and the particular operating conditions used in each, as well as on the peak-to-average power ratio of the speech signal. The latter, of course, varies with the individual, the microphone, and the characteristics of the speech equipment. It is perfectly possible — and quite common — for the peak output to be greater than the average d.c. input that produces the peak. It is also possible for it to be considerably less, as with Class A

operation. Thus a d.c. input of 100 watts on voice peaks might mean a peak r.f. output of anywhere from 25 watts to 200 watts, an even more confusing condition than with the a.m. transmitter. The s.s.b. transmitter has to be rated in terms of its peak output if comparisons are to be made.

On digging into this question of the a.m. equivalent of single sideband, it becomes apparent that the comparison does not involve transmitters alone, but that what the man at the receiving end does is equally important. The receiver band-



width is an inescapable element in the comparison. In what follows it will be assumed that two receiver bandwidths are available. That is, if we assign the range from zero to 3000 cycles as being sufficient for speech, the effective receiver bandwidth can be either 6 kc., as in normal a.m. reception, or 3 kc. when set for receiving one sideband only. Under these conditions the noise power output of the receiver when set for 3-kc. bandwidth is just half the noise output when set for 6-kc. bandwidth, since the power in the kind of noise we are talking about is proportional to the bandwidth. (Actually, most communications receivers do not give an exact 2-to-1 choice of bandwidth — except with a selectable-sideband arrangement such as the "signal slicer"² — but the assumption is necessary in order to have a basis for comparison.)

An important practical consideration is that both a.m. and s.s.b. signals will meet both bandwidths, or something approximating them, at various receivers under various situations. Many operators use selectable sideband reception (Q5-ers and the like) on a.m. either customarily or when necessary on account of interference. Likewise, many operators will use full a.m. bandwidth, either from choice or necessity because the receiver doesn't have anything sharper, for s.s.b. reception. There are thus, using the figures above for the sake of identification, three practical situations to be covered: a.m. reception with 3-kc. bandwidth *vs.* s.s.b. reception with 3-kc. bandwidth, a.m. with 6-kc. bandwidth *vs.* s.s.b. with 3-kc. bandwidth, and a.m. with 6-kc. bandwidth *vs.* s.s.b. with 6-kc. bandwidth.

After disposing of one final preliminary we can get down to cases. For simplicity's sake, the comparisons will be based on single-tone modulation. The power in the sideband with such a modulating signal is not the same as with speech, but the results in terms of ratios carry over directly to the speech case if we assume that the speech signal will have the same waveform with

either a.m. or s.s.b. To make the example specific, we will choose an audio tone of 1000 cycles.

The First Case

Reception with 3-kc. bandwidth for both a.m. and s.s.b. is selected for consideration first, for the reason that it is the easiest to follow.

The left-hand group of drawings in Fig. 1 shows what takes place in receiving the a.m. signal. The spectrum of the signal consists of the carrier and upper and lower sidebands, spaced 1 kc. either side of the carrier. Since 100 per cent modulation is assumed, each sideband has exactly one-half the carrier amplitude. The signal is tuned in so that the carrier is placed at the low-frequency edge of the 3-kc. bandwidth for reception of the upper sideband only. (Noise and interference that may exist in the lower sideband region will be rejected.) The signal arriving at the second detector consists, consequently, of the carrier and the upper sideband. What is heard in this case is the beat between the two, and it is generated in the second detector by the vector process shown at the bottom. The instantaneous amplitude is equal to the vector sum of the carrier and the sideband, but since the two are on different frequencies this sum varies at a rate equal to their difference. This is represented by the circular path followed by the extreme end of the sideband vector, and in this example the sideband vector would rotate 1000 times per second with respect to the carrier vector. The variation in total amplitude (not the amplitude itself) is the audio output of the detector, and this variation occurs between the extremes indicated by the upper and lower dashed lines. As the total amplitude varies smoothly from the carrier level to maximum and down to minimum and back, it generates the audio signal shown.

A little study will show that the amplitude of the carrier alone has no effect on the audio output

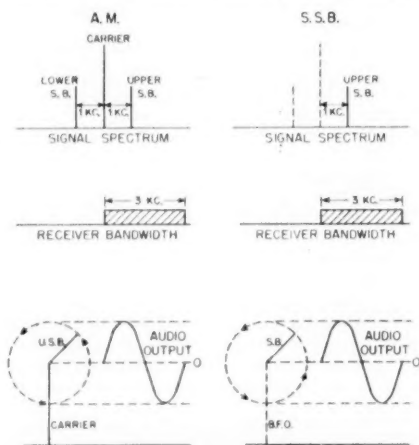


Fig. 1 — Comparison of amplitude modulation with single sideband when both signals are detected in a receiver having just sufficient bandwidth to accept one sideband.

² G.E. Ham News, Vol. 6, No. 4, July, 1951.

of the detector, just so long as it is large enough to accommodate the sideband vector when it is pointing downward and generating the negative peak of the audio output signal.³ The carrier can have any amplitude greater than this minimum. In other words, it is the sideband amplitude alone that determines the amplitude of the a.f. output from the detector.

In the single-sideband case, shown at the right, only the upper sideband is transmitted. The eliminated carrier and lower sideband are shown by dashed lines simply for reference. The upper sideband is inside the 3-ke. bandwidth of the receiver, and at the second detector the b.f.o. is used to supply the missing carrier. In the lower drawing, the b.f.o. amplitude is shown the same as that of the carrier in the a.m. case, but as stated above, its actual amplitude does not matter so long as it is large enough. The sideband is shown with the same amplitude as in the a.m. case; the process of generating the audio output is the same. Also, since the receiver bandwidth is the same in both cases the noise is exactly the same, so both types of transmission give the same signal-to-noise ratio. Except for the fact that with a.m. the carrier is supplied by the transmitter and with s.s.b. by the receiver b.f.o., the two cases are identical.

Determining the a.m. equivalent of the s.s.b. signal is easy. In the a.m. signal one sideband has half the amplitude of the carrier or one-fourth as much power as the carrier. Since only one sideband is received in both cases, they must have the same amplitudes and powers to produce equal audio outputs from the detector. That is, if the s.s.b. signal is 100 watts, the upper sideband of the a.m. signal must be 100 watts. But this requires a carrier power of four times the power of one sideband with a.m., so to produce the same audio output with a.m. the carrier must be 400 watts. Hence with this type of reception 100 watts of s.s.b. is equivalent to 400 watts of a.m. Or, if we compare a 100-watt a.m. signal with a 100-watt s.s.b. signal, the s.s.b. is 6 db. better.

At about this stage the discerning reader will detect a clinker in this 6-db. figure and be quick to point out that this is giving the single-sideband signal all the breaks. In receiving the a.m. signal we threw away one of the sidebands, and although it may have been saying exactly the same thing as the one we kept, it is certainly reasonable to suppose that two of them shouting in unison would make considerably more noise than one by itself. The critic would be quite right; the comparison isn't fair to the a.m. signal. But Case 1 does represent a practical situation, and one that will become more and more representative as more and more 'phone operators go to single-sideband reception of the selectable variety in order to dodge interference. Conclusion: *If the*

receiver bandwidth is such as to accept only one sideband of the a.m. signal, 100 watts of single sideband is equivalent to a 400-watt 100 per cent modulated a.m. carrier.

The Second Case

A theorist would say that the only tenable comparison is one based on each system operating on its own home grounds — that is, with 6-ke. receiver bandwidth for a.m. and 3-ke. bandwidth for s.s.b. Then all of the transmitted energy in each signal is accepted and used by the receiver, and no more noise is introduced than is absolutely necessary to preserve the speech band required. This is fair enough, although it is probably less representative of actual amateur practice at its present stage of development than the other two of our three cases. Since we are changing receiver

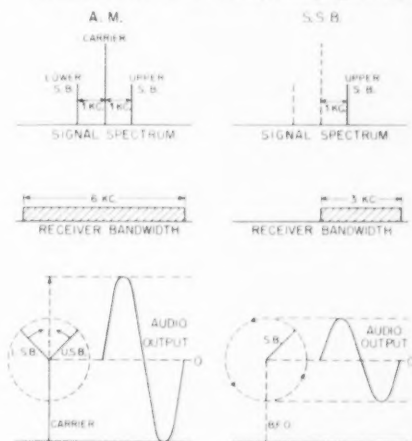


Fig. 2 — Comparison of amplitude modulation with single sideband when the receiver bandwidth is adjusted to accept all the significant energy, but no more, transmitted in either type of signal.

bandwidth, Case 2 requires two comparisons — talk power, and signal-to-noise ratio.

Fig. 2 presents this case in a fashion corresponding with Fig. 1. The a.m. carrier and its sidebands are drawn to the same scale for easy comparison with Fig. 1. However, the receiver bandwidth for the a.m. signal is now 6 ke. and both sidebands contribute to the audio output. While each sideband traces a circle, in the vector diagram, similar to the circle traced in Fig. 1, they rotate in opposite directions and at the same rate, so that the vector sum is not traced by the circle but moves up and down along the same line on which the carrier lies. When both sideband vectors are along the same line as the carrier and are pointing upward, their sum is equal to the carrier amplitude and the total amplitude, carrier plus sidebands, is equal to twice the carrier amplitude. When both lie on the carrier line pointing downward their sum is again equal to the carrier amplitude but the direction is opposite, so the total amplitude is zero. Thus the instantaneous amplitude varies between zero and twice the carrier

³ This is true as a first approximation, but neglects distortion that occurs when the ratio of carrier to sideband amplitude is not high. The correction for this is of no consequence in the present discussion.

amplitude, and the audio output is equal to these variations. This should be quite familiar, since it is merely a description of a 100 per cent modulated wave.

In the single sideband column of Fig. 2 we have retained the same sideband amplitude as in Fig. 1—that is, the amplitude is the same as that of one sideband of the a.m. signal. In fact, everything in this column is identical with the s.s.b. column in Fig. 1. The audio output has exactly half the amplitude of the output from the a.m. signal; that is, it has only one-fourth the power of the a.m. output.

Now for the talk-power comparison. If the s.s.b. signal is 100 watts, one sideband of the a.m. signal also is 100 watts, since the sidebands are drawn to the same scale. An a.m. signal with 100 watts in one sideband must have a carrier power of 400 watts, just as in Case 1. But the 400-watt a.m. signal produces an audio output having four times as much power as the 100-watt s.s.b. signal. To bring it down to the same level, we should have to reduce the a.m. power by a factor of four, to a carrier of 100 watts. Conclusion: *If both sidebands of the a.m. signal are received, 100 watts of single sideband is equivalent in talk power to a 100-watt, 100 per cent modulated a.m. carrier.*

This, we believe, is the sort of comparison most hams have at the backs of their minds in asking for the a.m. equivalent of single sideband. It is probably the most useful way of rating comparative powers, from an all-around standpoint.

Now about signal-to-noise ratio. As stated earlier, the receiver noise power with the 3-ke. bandwidth will be just one-half the noise with the 6-ke. bandwidth. Hence in receiving the s.s.b. signal with no more bandwidth than is necessary, we can reduce the noise by 3 db. This is a gain on the single-sideband side, and means that for the

by this time. There is no difference from Case 2 in talk power. The only change is that we add 3 db. of unnecessary noise to the s.s.b. signal, thus wiping out its signal-to-noise ratio advantage in Case 2. Conclusion: *When a.m. bandwidth is used for both a.m. and s.s.b. reception, 100 watts of single sideband is equivalent to 100 watts of 100 per cent modulated a.m. carrier in both talk power and signal-to-noise ratio.*

The A.M. Equivalent of S.S.B.

Summing it all up, the most logical *intrinsic* comparison of s.s.b. vs. a.m. is, we believe, contained in the statement that *the two types of signals are equivalent when the peak power output of the single-sideband transmitter is the same as the carrier power output of the a.m. transmitter, assuming 100 per cent modulation in the a.m. case.*

When s.s.b. is equivalent to more than that a.m. power, it is because of the method of reception and not because of any inherent qualities in the signals themselves.

What About That 9 Db?

Somewhere along the line the much-quoted 9-db. gain seems to have been pitched out the window, and this story would not be complete if it were left dangling in mid-air. Where did it go?

Let's see that quote from the first page of this article again: "Single-sideband operation can give 9-db. signal-to-noise ratio improvement over amplitude modulation operating at the same peak power output." It says exactly what it means, but not what a lot of fellows seem to have read into it. It does not say "9 db. gain," for instance, but "9 db. signal-to-noise ratio improvement." It does not say "the same power output" but "the same *peak* power output." Finally, it does not say "will give" but "*can* give."

Let's examine the actual wording carefully. We have just seen that the signal-to-noise ratio depends a lot on what kind of receiver bandwidth the man at the receiving end has available and what he chooses to do with it. We have also seen that (Case 2) there is a 3-db. signal-to-noise ratio improvement in favor of single sideband when the receiver bandwidth appropriate to each mode of transmission is used. This 3 db. is included in the 9-db. figure, so subtracting it leaves 6 db. as what most amateurs think of as gain.

Take that statement about peak power output. In this article we have been comparing peak output on single sideband with carrier output on amplitude modulation, because we believe that practically all amateurs think of a.m. in terms of the carrier. But the *peak* a.m. output is *four times* the carrier output, with 100 per cent modulation. That four-times peak is what Norgaard was equating to the single-sideband output. To use the same terminology as the quoted statement, our conclusion should be rephrased in this way: 100 watts of single sideband is equivalent to a peak output of 400 watts of 100 per cent modulated amplitude modulation. The difference is just 6 db., and so the whole 9 db. is accounted for.

(Continued on page 118)



same signal-to-noise ratio in both methods, the a.m. power must be increased 3 db. Conclusion: *For equal signal-to-noise ratio, assuming receiver bandwidth adjusted for accepting both sidebands for a.m. and only one sideband for s.s.b., 100 watts of s.s.b. is equivalent to a 200-watt 100 per cent modulated a.m. carrier.*

The Third Case

Case 3, where the 6-ke. bandwidth is used for both a.m. and s.s.b. reception, should be obvious

An Unusual 75-Meter Mobile Antenna

BY ANSON B. HAUGHTON,* W3PNR

THE photograph below shows a rather unorthodox antenna that has worked out very well in the author's 75-meter mobile installation. Needless to say, anyone who is easily embarrassed at being the center of attraction will be wasting his time to read farther. If, on the other hand, you are of the type who likes to try out new lines of approach, and don't mind answering the questions of the curious, you might get some ideas out of this effort.

To compensate for the antenna's startling appearance, a check in daytime at a distance of 140 miles produced a report of S7 to 8, while another mobile alongside, same power, same frequency, but with a conventional center-loaded whip, could be copied with difficulty if at all, at the same receiving station.

The unusual part consists of a frame of 1 × 2-inch wood supporting a 4-ft. square of aluminum sheet. The upright pieces are 11 inches long, and the structure is mounted on a vacuum-cup ski rack. These uprights are fastened to the ski-rack boards, and to the cross members of the frame holding the aluminum sheet, by heavy 3-inch metal angles (obtained in hardware stores) and bolts. With some bitterness, the author can verify the italics. The entire top section of the first such antenna built is probably still lying in some Southern Connecticut cow pasture. (The exact point of departure is not known.) Apparently, a gust of wind pulled the previously-used wood screws out of the uprights, and the whole thing sailed merrily away!

The aluminum sheet is stiffened by a 1 × 3-inch aluminum channel running fore and aft. A 5-ft. whip is connected at the center.

This construction has resulted in a very sturdy antenna which, for six months, now, has taken all kinds of beating with no trace of vibration, or

other troubles, at speeds up to 60 m.p.h. or more. Some vibration was originally encountered in the suction cups. Their mountings can be bent to give a better fit, but the best cure is to fasten them also with glycerin instead of water.

Only 13 turns of a B & W BVL coil are necessary to resonate the system at 4 Mc. This coil is connected between the underside of the aluminum sheet and a motor-driven tuning coil, taken from a BC-375, housed in a box directly underneath. The motor is one taken from an old electric windshield wiper. This combination permits tuning over the band from the driver's seat. Only a few turns of the tuning coil are required to cover the c.w. as well as the 'phone portion of the 80-meter band. The bottom end of this coil is connected to the transmitter (ARC-5) output link with a length of No. 12 rubber-covered wire. Since it is probable that this wire is contributing substantially to the radiation, it should be kept as well spaced from the car body as possible.

To indicate when the antenna is tuned to resonance, a wavemeter was installed on the dash in place of the clock originally supplied with the car. A pick-up wire for the wavemeter runs out under the aluminum sheet. The antenna is then tuned for maximum deflection at the desired frequency.

It might be of interest to those who work the higher-frequency bands, as well as 75 meters, to know that I have found that the system resonates at something above 14 Mc. with all loading inductance removed. Therefore, it should be possible to work out a system that would operate on all of the high-frequency bands.

It should be said in closing that this antenna has been described, not so much with the idea that it will be duplicated exactly, but more as a suggestion for further experimentation. The important fact is that it gets out.

W3PNR finds that this mobile "penthouse" antenna gives surprising results on 75. (Photo by W3UVI).

January 1954



A Crystal-Controlled Converter for 432 Mc.

Improved Sensitivity and Stability in U.H.F. Reception

BY EDWARD P. TILTON,* WIHQD

THINGS have happened fast on 420 in recent months. After years of playing with surplus radar and altimeter rigs, 420-Mc. enthusiasts have now almost wholly converted to crystal-controlled or otherwise stabilized transmitters. This has made possible the use of high-selectivity receivers, and v.h.f. history is now in the process of repeating itself on our lowest u.h.f. band. The day of the broadband radar-type receiver and its companion in crime, the modulated oscillator, has now passed, and hams who have had disappointing results with such antiquated gear are shedding no nostalgic tears. The broadband approach is OK for strictly local work, but for paths much beyond line of sight it is *out!*

As soon as work with selective receivers was attempted it became apparent that tunable converters for 420 Mc. were also hopeless. Unless exceptional precautions were taken it was impossible to build a tunable oscillator stable enough for effective c.w. reception, and even voice signals were difficult to hold in a passband of communications receiver proportions. Obviously, crystal control in the converter, already becoming standard equipment for v.h.f. work, was a must for 420, if we were to make full use of this attractive territory.

Next came the question of the relative merits of crystal-diode and vacuum-tube mixers. Much published literature indicated that crystal mixers were equal or superior to vacuum tubes at 500 Mc. and higher, but when the writer tried crystal mixers at 420 Mc. the results were not at all what

we had hoped for. Many hours of work with a crystal-controlled crystal-mixer converter having no r.f. amplifier ahead of it brought results that were never quite up to reception we'd obtained with a 6J6 mixer job built some years before.¹

We were about to give up on crystal mixers when it was decided to have a try at r.f. amplification. Either of two coaxial-line r.f. amplifiers² used ahead of the experimental converter brought its sensitivity up to at least that of the 6J6 mixer job, and the stability afforded by the crystal control made it possible to locate and copy very weak signals that could not be spotted or held with the tunable converter.

The next phase of our 420-Mc. receiver program involved the use of new triodes that were being developed by several tube manufacturers for u.h.f. TV applications. Work with these tubes (soon to appear as the 6AJ4, 6AM4 and 6AN4) brought about a further improvement in our receiver performance. Preamplifiers using them³ netted us a noise figure of around 6 db., and brought our 432-Mc. coverage up to where it closely approximated 144-Mc. experience.

Receiver Design Considerations

Discussion of u.h.f. receiver problems at radio clubs, over the air, and in correspondence reveals that there are numerous mistaken notions current in regard to the factors that make for good receiver performance at 420 Mc., so perhaps a brief discussion of some of them will not be amiss here.

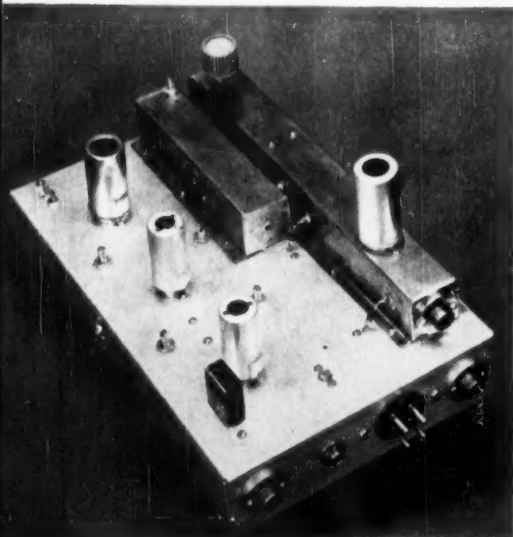
Foremost is the matter of noise; its sources, and ways to keep it within bounds. Noise in a receiver having a crystal mixer front end comes not only from the mixer itself; the i.f. amplifier following it is a contributing factor. If we use a crystal mixer with no r.f. amplifier ahead of it, the performance of the i.f. amplifier is of great importance. Particularly if the i.f. is 30 Mc. or more, its first stage almost has to use a low-noise

* V.H.F. Editor, QST.

¹ "Better Results on 420 Mc.," August, 1950, QST, p. 11.

² "R.F. Amplifiers for 420 Mc.," January, 1952, QST, p. 28.

³ "Low-Noise R.F. Amplifiers for 144 and 420 Mc.," August, 1953, QST, p. 13.



A crystal-controlled converter for 432 to 436 Mc. R.f. and mixer stages are in copper subassemblies at the right. Oscillator, multiplier and i.f. amplifier are on the left side.

QST for

triode, if we are to obtain satisfactory performance in our u.h.f. receiver.

But if we have a good r.f. stage, the performance of the mixer and i.f. amplifier stages is not too important. The r.f. amplifier will establish the noise figure of the system; perhaps not completely, but to such an extent that extreme care with following stages is not required. In our converter we use a low-noise dual triode i.f. amplifier, but we need take no special precautions to see that its performance is absolutely topnotch. It was not found necessary, for example, to neutralize the stage, as it would have been had the 6BQ7 been an r.f. instead of an i.f. amplifier.

One common source of high noise figure and poor performance in crystal mixers is the injection of more than one frequency from the oscillator-multiplier chain. Each frequency con-

tributes noise, but only one beats in the desired signal. Thus, if no r.f. stage is used the oscillator and multiplier stages must be treated in the same manner as in TVI-proofing a v.h.f. transmitter. Lower-frequency stages must not be allowed to pass on the various multiples of the crystal frequency to the crystal mixer. Several workers have reported improved results when high-Q isolating stages were installed between the last multiplier and the crystal mixer.

Elaborate precautions of this nature are not needed when a good r.f. stage is used, however. The construction shown herewith is entirely adequate. Instead of using high-Q filtering circuits, we put the "Q" in the r.f. amplifier tank circuit, where it will do the most good.

Noise figures generally quoted in u.h.f. TV receiver literature are somewhat misleading. The

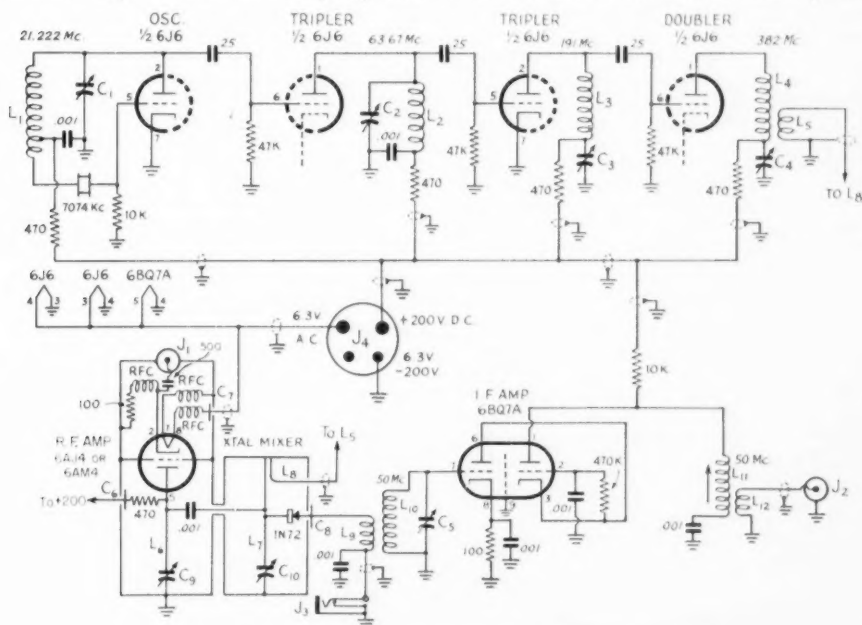
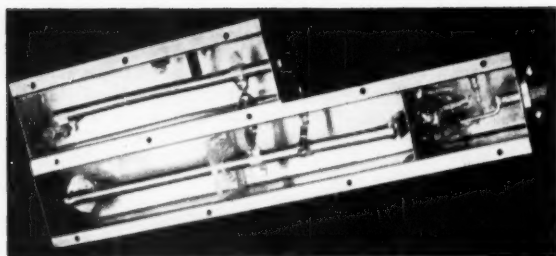


Fig. 1—Wiring diagram and parts list for the 432-Mc. crystal-controlled converter. Values given are for an i.f. of 50 to 54 Mc.

- C₁—75- μ f. miniature trimmer (Hammarlund MAPC-75).
- C₂, C₃, C₄—20- μ f. miniature trimmer (Johnson 20M11).
- C₅—25- μ f. min. trimmer (Hammarlund MAPC-25).
- C₆, C₇—500- μ f. feed-through ceramic (Centralab MFT-500).
- C₈—Handmade copper-tab by-pass; see text.
- C₉—Handmade copper-tab variable; see text.
- C₁₀—0.5- to 5- μ f. plastic trimmer (Eric style 532-08 OR5).
- L₁—13½ turns No. 20 tinned, 5/8-inch diam., 7/8 inch long, tapped at 4½ turns (B & W Miniductor No. 3007).
- L₂—5 turns No. 20 tinned, 1/2-inch diam., 3/8 inch long (B & W Miniductor No. 3003).
- L₃—2¾ turns similar to L₂.
- L₄—2 turns No. 12 tinned, 1/4-inch diam., 1/4 inch long.
- L₅—1 turn insulated wire between turns of L₄. May be inner conductor of shielded wire, with braid removed.

- L₆—Half-wave line, 1/4-inch copper tubing, 7½ inches long.
- L₇—Quarter-wave line, 1/4-inch copper tubing, 5 inches long.
- L₈—Loop of insulated wire 1 inch long and 1/2 inch high projecting through base plate on which line assemblies are mounted. May be made from inner conductor of shielded wire, with braid removed from last two inches.
- L₉—2 turns No. 22 enam. around cold end of L₁₀.
- L₁₀—6 turns similar to L₂.
- L₁₁—11 turns No. 22 enam. close-wound on 3/8-inch slug-tuned form (National XR-91).
- L₁₂—4 turns No. 28 silk or enamel wound over cold end of L₁₁.
- J₁, J₂—Coaxial chassis receptacle.
- J₃—Closed-circuit jack.
- J₄—4-pin male chassis receptacle.
- RFC—10 turns No. 22 tinned, 1/4-inch diam. Space turns diam. of wire.



Interior view of the r.f. amplifier and mixer assemblies. The r.f. circuit is a half-wave line. The shorter assembly is the quarter-wave line using a crystal diode mixer.

best we've seen claimed is about 12 db., which makes our 6-db. figure look a little optimistic. But u.h.f. TV designs are intended to cover 470 to 900 Mc. The various critical factors that affect front-end noise figure simply cannot be maximized over such a frequency range. Our converter need cover less than *one per cent* of the frequency range of a converter that must serve TV needs, so we can set adjustments like the B-plus feed point and output coupling "on the nose" for our narrow tuning range. That's where the difference lies.

Then TV front ends must be flat across a 6-Mc. band. Ours need not be flat at all; we have no objection to twiddling an r.f. tracking adjustment while tuning across even 432 to 436 Mc., if it will net an improvement in weak-signal reception. It *does*, if the coupling circuits are set up for optimum performance.

Converter Details

The 432-Mc. converter pictured and described here is the result of several years' experience with r.f. amplifiers, mixers and i.f. amplifiers for u.h.f. reception. It uses a crystal mixer only because the crystal diode is the simplest way out of the mixer problem. The r.f. stage is the source of the converter's excellent performance.

The amplifier is an almost exact duplicate of its August, 1953, predecessor,³ except for the coupling into the crystal mixer. For those who may not have the issue available, the details are repeated here. It is the longer of two trough lines made of flashing copper and is 10 inches over-all, and 1 1/4 inches square. The tube socket mounted on the top surface is centered 2 inches from the end. The shield dividing the socket is offset 1/4 inch farther along the line, so that only Pins 4 and 5 are located wholly within the plate compartment.

The half-wave plate line is made of 1/4-inch copper tubing 7 3/16 inches long. The plate end is slotted to a depth of about 1/8 inch with a hack saw, and a tab of flashing copper is soldered into this slot for making the plate connection. A block of polystyrene at the approximate middle of the line provides support. Tuning is done with a round tab of copper about the size of a penny soldered to a screw that is fitted with a 1/4-inch sleeve and a knob for adjustment purposes. The screw goes through a nut soldered to the trough. A similar tab is soldered to the end of the plate line, to form the fixed plate of C_s . The B-plus and

coupling connections are made with grid clips, to permit adjustment of their position.

In the end compartment are the cathode and heater r.f. chokes, input coupling capacitor, and cathode bias resistor. Antenna coupling is directly to the cathode, through the coupling condenser, as the input impedance of the grounded-grid stage is so low that nothing is gained from the use of a tuned input circuit.

The mixer circuit is a quarter-wave line, with the r.f. amplifier output coupled in at a point about 1 inch from the cold end. The crystal diode is inserted in a close-fit hole in the inner conductor at a point 1 inch farther up the line. Tuning is done with a plastic trimmer at the hot end. The mixer requires no retuning across the band. Flashing copper of the same width as that used for the r.f. line and 5 1/2 inches long is folded in the same 1 1/4-inch square fashion. The inner conductor is 1/4-inch copper tubing 5 inches long. The two troughs are made separately, but their inner edges are overlapped in mounting. The inner walls are joined by a 1/2-inch piece of 1/4-inch copper tubing that is soldered into holes in these walls. This provides a sleeve through which the coupling lead is fed. The d.c. blocking capacitor is in the r.f. assembly.

Injection is fed into the mixer compartment by means of a loop that runs through the chassis and the copper bottom plate that completes the r.f. and mixer subassembly. The coupling loops, L_5 and L_6 , can be made by removing the braid from both ends of a length of shielded wire, the remainder then serving as coaxial line between the loops. The mixer loop is 1 inch long and 1/2 inch high, so it requires removing the braid from slightly more than 2 inches of the shielded wire. The other loop is about one-quarter inch in diameter so it takes only a little more than an inch of the inner conductor. The position of inductance L_6 with respect to the inner conductor of the mixer line is not particularly critical, as it is no problem to develop the approximately 0.5 milli-ampere of rectified crystal current needed for efficient mixing.

Note the handmade by-pass capacitor C_s on the outside of the mixer line. This is a 1/2-inch diameter copper tab insulated from the trough by two thicknesses of vinyl plastic such as is used for small radio parts envelopes. The mounting screw goes through a 1/4-inch hole, and is held in place by a fiber washer under a nut on the inside of the trough. The purpose of this capacitor is to

by-pass 432-Mc. r.f., while allowing the 50-Mc. i.f. to pass on to the triode amplifier.

Any u.h.f. crystal diode may be used. The 1N72 is inserted in a hole in the inner conductor, and the insulating sleeve of the diode just fits in a $\frac{3}{16}$ -inch hole drilled in the wall of the trough. If radar-type diodes are used, some method of insulating the large end from the trough will have to be devised. The brass sleeve can be wrapped with plastic tape, for example.

The turned-over edges of the two troughs are overlapped and the two assemblies are bolted to the chassis at frequent intervals around their edges. A copper plate is cut to fit the underside, so that all sides will be of the same material.

Operation of the oscillator-multiplier chain is similar to that of the exciter stages of a transmitter, except that they need not be "pushed" to obtain the necessary injection power. A readily-available 7-Mc. crystal is used as a third-overtone oscillator in the first half of a 6J6, the second half of which triples to 67 Mc. A second 6J6 triples and doubles to 382 Mc. Plate circuits of the last two multipliers are series tuned. The crystal frequency multiplies out so that 432 to 436 Mc. can be covered by tuning 50 to 54 Mc. At WHDQ we run the converter into a 50-Mc. crystal-controlled converter, and tune 7 to 11 Mc. In this way, 432-Mc. signals tune exactly the same as those in the 7-Mc. range. To anyone who has attempted the use of tunable oscillators in 420-Mc. work, this is at least a minor miracle!

If the builder has no 50-Mc. converter or receiver, the i.f. can be changed to the 30-Mc. region by suitable alteration of the crystal frequency and the i.f. amplifier components. Any i.f. above about 20 Mc. can be used in this way. The tuning range 432 to 436 Mc. is used because this is the segment of the band which by mutual agreement is used exclusively for stabilized transmitters. Coverage of the rest of the band can be had by changing crystals, so that the i.f. will fall in the 50-Mc. region for all frequencies. Somewhat more than 4 Mc. can be covered successfully with the one crystal recommended here, the only limitation being the broadband characteristics of

the i.f. circuits of the 432-Mc. converter and the tuning range of the converter or receiver with which it is used.

No bottom plate has been used on the converter so far, but it is possible that the oscillator-multiplier chain might cause TVI where multiples of the crystal frequency fall in locally-used channels. A bottom plate would complete the shielding needed to cure such a condition, and filtering of the power leads could be added in extreme cases.

Adjustments

The oscillator-multiplier stages should be checked first, with either heater or plate voltage removed from the i.f. and r.f. amplifiers. The procedure is similar to that involved in firing up a transmitter, so it need not be detailed here. Measure the rectified crystal current in J_1 . Anything from 0.2 to 1.0 ma. is satisfactory, with 0.5 to 0.6 ma. as a good average value.

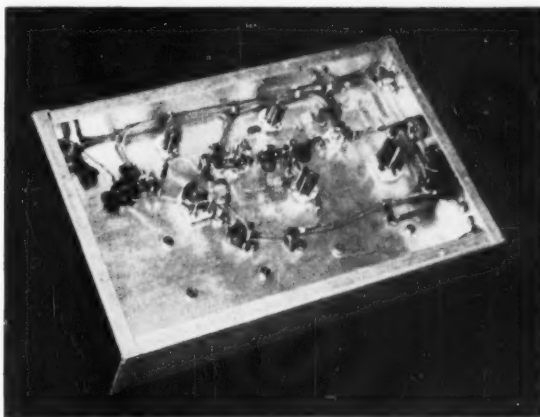
Next, activate the i.f. stage and peak it to the middle of the intended tuning range on noise. No neutralization is used in this cascade stage, as the lowest possible noise figure is not required.

Now apply heater and plate voltages to the r.f. amplifier. It should be possible to peak this stage and the mixer on noise also, if the adjustments are nearly correct to start with, but results may come easier if a test signal is available. The only critical adjustments are the positions of the B-plus and output coupling taps on the line. The B-plus should be fed in at the minimum-voltage point. This can be determined by running a temporary injection loop into the mixer line, with the r.f. and mixer assembly resting on its side. With a test signal tuned in, run a lead pencil along the r.f. line until the spot is found that has no effect on reception. Put the B-plus clip there.

The output coupling should be set at the point that gives the best signal-to-noise ratio. A noise generator is helpful, though not absolutely necessary, here. Too near the low r.f. voltage point will result in critical tuning and regeneration. Too far out on the line will reduce the gain and broaden

(Continued on page 122)

Bottom view of the 432-Mc. converter, showing the oscillator, multiplier and i.f. amplifier circuits.



A Transistor Self-Powered C.W. Monitor

Applying Modern Techniques to an Old Problem

BY DONALD KLEIN,* WIGKR, AND WILLIAM SLUSHER,* W8ZYX/1

WITH the increasing use of semi- and fully-automatic keys, the need for continuous monitoring becomes increasingly important. But no matter what form of manual keying is used, a good keying monitor is a prime requisite for the successful development of a good fist.

A good keying monitor should at least fulfill the following requirements:

- 1) Follow faithfully the keying of the transmitter, without distortion or lag.
- 2) Be activated by actual r.f. output.
- 3) Require no attention when changing frequency within a band or when shifting bands.

If these requirements can be met without complexity, the goal is brought that much closer.

The "Monitone"¹ meets all three requirements, but it requires a separate power source for heater and plate voltages, which adds to the cost and complexity of the unit. Some might be tempted to draw the power from the receiver, but in many shacks the receiver is already called upon to supply one or more accessories such as converters, crystal calibrators, Select-o-jects, and what have you. Therefore, it would seem highly advantageous to rid ourselves of the more conventional power supplies.

The answer, of course, is an r.f. power supply. Several years ago, when the 117-volt heater diode-tetrode tubes were first introduced, the 117N7 was pressed into just such a service. The diode section served as a rectifier of the r.f. supplied to it by a link loosely coupled to the output of a transmitter. The resulting d.c. was supplied to the tetrode section of the tube, which was connected as an audio oscillator. With the key up, no r.f. appeared at the output of the transmitter and the audio oscillator was silent. When the key was closed, the oscillator received plate power via the rectifier and yielded an audio signal. What could have been simpler? In those days

the answer was, "Very little," but in time, improvements usually are possible.

With the appearance of the germanium crystal diode soon after the war, the chance came to make an even more compact monitor. A 1N34 and 6C4 (built in a 4 × 4 × 2-inch box) soon replaced the 117N7 monitor at WIGKR. Aside from the r.f. power source, only heater power had to be supplied. The receiver hardly felt the additional load of the 6C4's heater.

When the transistor appeared it gave impetus to construct still another monitor. Then even the filament power source could be forgotten. The monitor then reached the stage where it could be reduced in size and power requirements to a degree that even made it practical to take along with the rig on field trips.

The Circuit

The self-powered c.w. monitor employs a 1N34A crystal diode as an r.f. rectifier supplying a 2N32 point-contact transistor. The basic oscillator could hardly be simpler, as can be seen from

Fig. 1. Besides the transistor, the only components are a resistor, condenser, and inductance. We have pondered a further reduction in the number of parts without much success. As is shown in Fig. 2, only a few additional components are necessary to transform the basic oscillator circuit into a monitor.

The late Fred Sutter, W8QBW/W8QDK, probably would have derived quite a lot of satisfaction from a circuit this simple. It was always his contention that the number of parts associated with a tube should be kept to a bare minimum, as additional parts are only supplementary and add little to the efficiency of the tube.

Much has been written recently in technical publications on the theory and operation of the transistor.² For our application, it is sufficient to say that current and voltage gains take place in a point-contact transistor with phase relationships such that a tuned circuit in the "base" lead will cause a large positive feed-back — and there we have our oscillator. It is im-

The self-powered c.w. monitor uses a germanium rectifier and a transistor audio oscillator. Rectified r.f. from the transmitter furnishes all of the necessary power, and the unit will work with any c.w. rig, regardless of the power level.



* % Sylvania Electric Products Co., 100 Sylvan Road, Woburn, Mass.

¹ Chambers, "The Monitone — Model 1951B," *QST*, May, 1951.

² Clay, "Transistor Circuitry," *QST*, December, 1953.

portant to use a "point-contact" transistor, as "junction" transistors have different current gains and will not oscillate in this circuit. Both junction and point-contact transistors are available, but they have quite different electrical properties.

One word of caution: Do not let the d.c. resistance of the base circuit become too large —

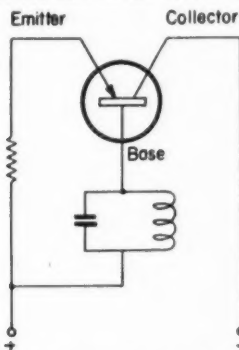


Fig. 1 — Only three components and a point-contact transistor are required for a simple audio oscillator.

say, above 2500 ohms — or the transistor will prefer to stay in one of the two possible steady states and refuse to oscillate. This, incidentally, is the principle used to make "flip-flop" circuits with transistors.

The monitor is powered from r.f. rectified by a germanium crystal diode. The r.f. is received by a short antenna, 1 to 2 feet in length, that is loosely coupled to the output of the transmitter. The amount of coupling will necessarily depend upon the output power of the transmitter. To

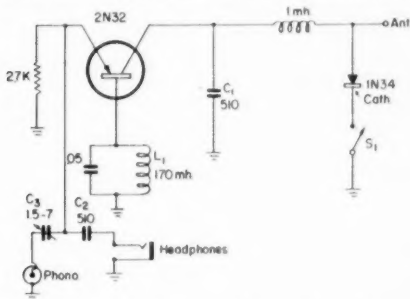
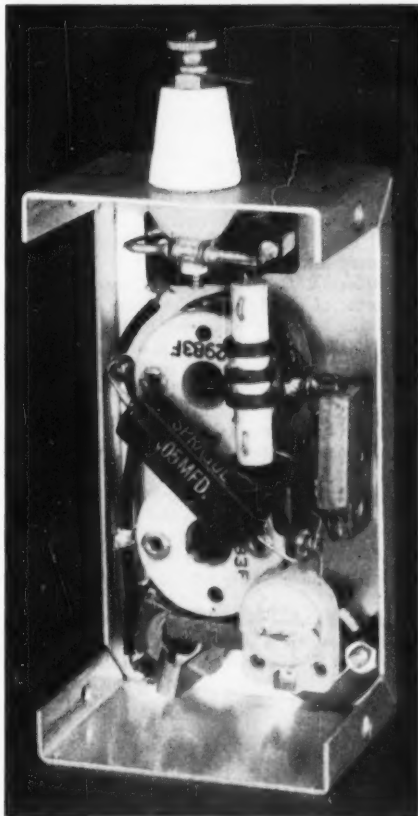


Fig. 2 — Circuit diagram of the self-powered c.w. monitor.

complete the power supply, an r.f. choke and condenser, C_1 , serve as a filter.

During the ten months the monitor has been in operation at WIGKR, various rigs ranging in power from 3 to 200 watts input, on 80 through 20 meters, have been used to power the monitor with equally good results. Although no operation has been attempted at frequencies higher than 14 Mc., there is little reason to doubt the ability of the germanium crystal diode to provide adequate d.c. power for the monitor up through 14 Mc.



This view of the c.w. monitor shows the rectifier (top, in front of the insulator) and the transistor (small black object directly above the ceramic trimmer).

Both headphone and indirect output are available from the monitor. Condenser C_2 allows direct coupling of headphones. The capacitance of this condenser may seem unusually small for audio coupling. Its size was chosen, however, to prevent excessive loading of the tuned circuit while still yielding sufficient output. A transformer might have been used instead, but this would have meant an increase in both cost and size. The ceramic trimmer, C_3 , is of even smaller capacitance. It allows the monitor to be plugged directly into the phono input, which is often available on the rear apron of a receiver. Because of the high reactance of the trimmer, looking back from the audio stage of the receiver, the tuned audio circuit causes no observable audio peaking in the output of the receiver. With the headphones plugged into the receiver, the trimmer is set to yield a comfortable volume with the audio control set at maximum gain.

The switch S_1 is used to open the d.c. circuit of the power supply. Its purpose is to disable the

(Continued on page 124)

Happenings of the Month

ELECTION RESULTS

Autumn balloting in ARRL director elections has resulted in the selection of four new directors and three new vice-directors to take office January 1st.

Gilbert L. Crossley, W3YA, becomes the new director of the Atlantic Division, his 985 votes showing a healthy lead over Henry A. Blodgett, W2UTH, with 645, and the incumbent Alfred C. Heck, W3GEG, with 607. Assistant professor of EE at Pennsylvania State College, new Director Crossley dates his ham activity back to 1919, and his organizational background includes the presidency of the Amateur Scientist Club of Erie, first SCM of Western Pennsylvania when the Communications Department was reorganized in the mid-twenties, and assistant director of the Atlantic Division during "Brad" Martin's terms of office. He is OPS, ORS, OBS, AEC, and civilian defense radio officer and state net control.

Taking office as the new vice-director of the Canadian Division will be **Reginald K. Town, VE7AC**, of Vancouver, employed in the distribution office of the *Sun* newspaper. The tally was 550 votes to 330 for Colin C. Dumbrille, VE2BK. OM Town has been hamming since 1921, when he started with spark; he was SCM of British Columbia in 1934-1935, and has in the past been president of both Club 13 and the British Columbia Amateur Radio Assn. He is ORS and OBS.

With 330 votes, **George H. Steed, WSBUX**, becomes director of the Delta Division, nosing out the incumbent, James W. Watkins, W4FLS, who received 315; Harvey L. Tref, W5GG, garnered 114 votes. The full-time mayor of Pine Bluff, Ark., Mr. Steed has been licensed since 1931, is president of the Pine Bluff Radio Club, and a commander, USNR.

In the Pacific Division, where incumbent Ken Hughes, W6CIS, was not a candidate, **Ray H. Cornell, W6JZ**, won the directorship handily by a count of 953 votes against 667 for Richard F. Czeikowitz, W6ATO. The new director has the long title of assistant technical superintendent in charge of the electronics technical branch of the supply department, San Francisco Naval Shipyard. A real old-timer, Ray was Oakland city manager for ARRL back in 1921. He has been president of the East Bay Radio Club, is currently SCM of East Bay, ORS, OO, civil defense communications chief for Albany and radio officer for Area 11, and for many years has conducted a regular schedule of machine-sent code practice from W6JZ.

Another professor joins the Board family in the person of **Harry M. Engwicht, W6HC**, who

becomes the new vice-director, Pacific Division, by 1127 votes to 484 for Guy Black, W6RLB. OM Engwicht is in charge of courses and student programming in communications and electronics at San Jose State College. One of the organizers of the Santa Clara County Amateur Radio Assn., he has at one time or another held most of the elective offices; he is a past president and currently vice-president of the Central California Radio Council, senior member of IRE, and RM, ORS, and AREC.

James P. Born, Jr., W4ZD, police dispatcher and technician of Atlanta, Ga., will be the new Southeastern Division director, tallying 584 votes to 530 for the incumbent, Ernest W. Barr, W4GOR. Better known as "Bubber," OM Born is president of the Georgia Cracker Radio Club, manager of the Georgia Cracker Net, SCM of the section, and ORS, OPS, OES and AREC.

Assuming the Southeastern vice-director post will be **Randall E. Smith, W4DQA**, with 576 votes to 538 for Thomas Moss, W4HYW. Electronics technician-in-charge for CAA at Orlando, the new vice-director has held various offices in the Orlando Amateur Radio Club, is currently EC for Orange County and communications officer for the county Red Cross.

In this year's elections, 53.8% of eligible voters returned their ballots. The Atlantic Division, with a lower return which is usual in larger divisions, brought down the average; the others were somewhat higher. The figures:

Atlantic	44.0%
Canada (vice-director only)	54.5%
Delta	55.1%
Pacific	65.0%
Southeastern	65.7%

ELECTION INJUNCTION SOUGHT

At its meeting in September to examine eligibility of director candidates as required in the By-Laws, the Executive Committee found several amateurs nominated who did not meet the ARRL membership requirement and, in accordance with the By-Laws, deleted their names from the ballots. Dissatisfied with the ruling of ineligibility of their candidates for director and vice-director of the Atlantic Division (James W. John, W3OMN, and John W. Gore, W3PRL) the Rock Creek Amateur Radio Association filed in the superior court at Hartford for a temporary injunction to overrule the Committee's action; in this they were joined by Paul Bossoletti, W0GZD, Dakota Division director candidate similarly declared ineligible.

The plaintiffs argue that the change in eligibility wording regarding the membership requirement (which resulted from the 1951 over-

haul of the Constitution & By-Laws) actually changed the meaning. The Executive Committee (which includes four directors who were members of the Board at the time the revised Articles of Association were adopted, two of them also being members of the committee which drafted the revision) felt unanimously there was no change, actual or intended, resulting from the new wording, and has continued since 1951 to apply the requirements which have existed for many years. At press time, no ruling has been made by the court.

EXAM POINTS CHANGE

Several changes in the field examination points have been made by FCC. Henceforth, amateur examinations will be held only once each year in Bangor, Me., Jamestown, N. D., Manchester, N. H., Marquette, Mich., and Tallahassee, Fla., whereas formerly they were held twice yearly. There will no longer be any field examinations in Cumberland, Md., Las Vegas, Nev., or Reno, Nev., where exams were formerly held once each year.

SPURIOUS RADIATION PROBLEMS

The amateur position in TVI matters was again brought to the attention of industry and government leaders by ARRL at the RETMA-IRE Radio Fall Meeting at Toronto, October 26th at a symposium exclusively concerned with spurious radiation problems in television.

Of primary interest to amateurs, among the numerous papers presented, was the report by Earl Anderson, W2UE, on the National Television Systems Ad Hoc Committee on Amateur—Color TV Interference.¹ ARRL Technical Director Grammer followed with a discussion of amateur-industry co-operation, pointing out that the committee was successful only because of the mutual assistance of each group concerned; his main theme, however, was that the problem will be solved only if each manufacturer, taking advantage of the research work done by the committee, actually puts into practice the recommendations which were made. He decried industry excuses that receiver design and production to provide reasonable protection from interference is costly, giving examples of receivers of different manufacture tested in the ARRL laboratory which appeared to have similar circuit diagrams and no obvious precautions against overloading, yet varied widely in their susceptibility to interference. So, he concluded, "this phase of the mutual interference problem should not be dismissed with the offhand observation that it costs too much."

Of allied interest is the address by FCC Commissioner George E. Sterling, W3DF, entitled "Blights on the Radio Spectrum," in which he outlined a number of interference problems which face the industry and which will have to be solved by it, he, incidentally, complimented the amateur body both on their work in organizing TVI Committees, and on the color TV problem.

¹ P. 31, QST, November, 1953.

EXAMINATION SCHEDULE

The Federal Communications Commission will give amateur examinations during the first half of 1954 on the following schedule. Remember this list when you need to know when and where examinations will occur. Where exact dates or places are not shown below, information may be obtained, as the date approaches, from the Engineer-in-Charge of the district. *Even stated dates are tentative and should be verified from the Engineer as the date approaches.* No examinations are given on legal holidays. All examinations begin promptly at 9 A.M. except as noted.

Albuquerque, N. M.: March 26.
Amarillo, Tex.: March 23.
Anchorage, Alaska, 53 U. S. Post Office Bldg.: By appointment.
Atlanta, Georgia, 411 Federal Annex: Tuesday and Friday at 8:30 A.M.
Bakersfield, Calif.: Sometime in May.
Baltimore 2, Md., 508 Old Town Bank Bldg.: Monday through Friday. When code test required, between 8:30 A.M. and 9:30 A.M.
Bangor, Me.: May 19.
Beaumont, Tex., 329 P. O. Bldg.: Monday through Friday except Thursday only when code test required.
Billings, Mont.: Sometime in May.
Birmingham, Ala.: March 4, June 2.
Boise, Idaho: Sometime in April.
Boston, Mass., 1600 Customhouse: Wednesday through Friday, 9:00 A.M. to 2 P.M.
Buffalo, N. Y., 328 P. O. Bldg.: Thursday.
Butte, Mont.: Sometime in May.
Charleston, W. Va.: Sometime in March and June.
Chicago, Ill., 826 U. S. Courthouse: Friday.
Cincinnati, Ohio: Sometime in February and May.
Cleveland, Ohio: Sometime in March and June.
Columbus, Ohio: Sometime in January and April.
Corpus Christi, Tex.: March 11, June 10.
Dallas, Tex., 500 U. S. Terminal Annex Bldg.: Monday through Friday, except Tuesday only when code test required.
Davenport, Iowa: Sometime in January and April.
Denver, Colo., 521 New Customhouse: 1st and 2nd Thursdays, 8 A.M.
Des Moines, Iowa: Sometime in January and April.
Detroit, Michigan, 1029 Federal Bldg.: Wednesday and Friday.
El Paso, Tex.: March 30.
Ft. Wayne, Ind.: Sometime in February and May.
Fresno, Calif.: March 17, June 16.
Grand Rapids, Mich.: Sometime in January and April.
Hartford, Conn.: March 9-10.
Hilo, T. H.: April 6.
Honolulu, T. H.: Monday through Friday.
Houston, Tex., 324 U. S. Appraisers Stores Bldg.: Tuesday and Friday.
Indianapolis, Ind.: Sometime in February and May.
Jackson, Miss.: March 10, June 9.
Jacksonville, Fla.: April 17.
Juneau, Alaska, 7 Shattuck Bldg.: By appointment.
Kansas City, Mo., 3200 Federal Office Bldg.: Friday.
Klamath Falls, Ore.: Sometime in May.
Knoxville, Tenn.: March 17, June 17.
Lihue, T. H.: April 20.
Little Rock, Ark.: Jan. 13, April 14.
Los Angeles, 539 U. S. Post Office and Courthouse: Wednesday, 9 A.M. and 1 P.M.
Louisville, Ky.: Sometime in May.
Manchester, N. H.: June 2.
Memphis, Tenn.: Jan. 8, April 9.
Miami, Fla., 312 Federal Bldg.: Thursday.
Milwaukee, Wis.: Sometime in January and April.
Mobile, Ala., 419 U. S. Courthouse and Customhouse: Wednesday and by appointment.
Nashville, Tenn.: Feb. 3, May 5.
New Orleans, La., 409 Audubon Bldg.: Monday through Friday except Monday through Wednesday only at 8:30 A.M. when code test required.

(Continued on page 128)

Getting the Most Out of Your Receiver

A Few Hints on Proper Handling

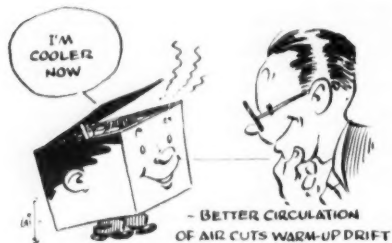
BY BYRON GOODMAN,* WIDX

ALTHOUGH amateur radio is generally considered to be a friendly hobby, one good way to get a punch in the nose is to tell a ham he doesn't know how to get the most out of his receiver. In no uncertain terms he will tell you (before or after the punch — this varies with the individual) that he has had a ham ticket for x years, and that if anyone can squeeze the last bit of usefulness out of the receiver, he can. Then he is likely to go on and say that there are some things that are wrong with his particular receiver, because it is a real dog that was designed by some self-styled engineers who were in reality idiots studying nights to become morons.

This article assumes that there are still a few non-belligerents who might be interested in getting the most out of their present receivers at no great cash outlay.

Design Faults

Let's take a very common case, the one where the owner criticizes his receiver because it has too much warm-up drift. (Actually, receivers are getting better in this department every year, but you still hear the criticism.) A very simple dodge is to prop up the lid an inch or so, with a



match folder or other convenient spacer, to provide for better air circulation. The maximum operating temperature will be reduced, and so will the warm-up drift. This is true, of course, of only the solid-cover receivers — you won't improve the circulation much by propping up a cane-metal cover.

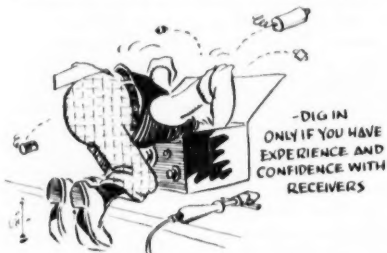
Another fault easy to find with a receiver is the location of the tuning knob — it's either too low or too high. The solution is simple if the knob is too low for you — prop up the receiver with books or a shelf of the proper height. (A shelf leaves a convenient cubbyhole under the receiver for logbook, call book and scratch pad.) If it's already too high, there isn't too much you can do, although some operators drop the rear of

the receiver into the table so that the panel is sloping.

Some receivers come through with tuning knobs that are too small, but anyone who suffers with this very long isn't thinking down the middle — it's easy to replace the knob with a larger one of your choice.

Frequency calibration is something that two-dial (bandset and bandspread) receiver owners worry about unnecessarily (in our opinion). It is, of course, quite difficult to set up the bandspread dial to read accurately by setting the bandset dial to some predetermined mark, but it's a cinch to do it if you have a 100- or 1000-kc. standard around the shack. At least it's a cinch to set it up for the band edge you're working closest to, and that's all you have to worry about during any particular operating period. If the receiver design is such that the bandset knob can get knocked out of adjustment (a frequent complaint), put a dial lock on it. Then when you set up the receiver on a band edge and lock the bandset knob, you have a well-calibrated receiver for that part of the band. The National Company offers its ODL locking device, which can be used with its Type O dial, and the James Millen Company has the 10063 and 10050 locks that are applicable. If you don't want to drill any additional holes in the receiver panel, it is sometimes possible to mount the lock on a strip of metal that is fastened to the receiver by screws under the bottom of the receiver or under the locknut on the dial shaft bushing.

There are so-called design faults that can be overcome by digging into the set and changing it over, but this should be done only if you have experience and confidence with receivers. Even then an owner is often justifiably reluctant to work over a receiver because he is afraid he might impair its resale value in some way. But



one thing that can be done without endangering its turn-in value is to make certain that the receiver is properly aligned, and peaked on the amateur bands. The i.f. alignment should be

* Assistant Technical Editor, QST

checked to be sure that its peak coincides with the crystal-filter frequency, but just touch up the i.f. trimmers and not those associated with the crystal filter (the modern ones are tricky and you can foul them up in a hurry). You do this by first tuning in a steady carrier (b.c. or frequency standard) with the crystal filter in its sharpest position and with the S-meter as the tuning indicator. Leave the tuning alone and just touch up the i.f. trimmers for maximum S-meter reading.

Many two-dial receivers can be improved in performance by aligning the front ends in the middle of the ham bands, letting the performance degrade if necessary outside these bands. All this means, of course, is peaking the r.f. and mixer stages while the receiver is tuned to a ham band, and the instruction book will tell you where to find the trimmers. Use the capacity trimmers if the ham band falls near the low-capacity end of the handset condenser, and the inductance trimmers if the ham band falls at the high-capacity end of the handset condenser.

Selectivity and Overload

Now let's get down to some of those ideas we had at the start, when we got that punch in the nose. One big operator fault is in not knowing the limitations of a receiver, and as a consequence unjustifiably criticizing a transmitted signal for a crime it didn't commit. Any superheterodyne has limitations of selectivity and signal-handling capability, and you can't call yourself an operator unless you can recognize them.

Take front-end selectivity, for example. Unless you realize that your receiver can have "images" in the higher-frequency ranges, you may be one of those who will wire ARRL and tell us to get that blankety-blank short-wave b.c. station out of the middle of the 14-Mc. band, which investigation will show to be a powerful station around 15 Mc. riding through as an "image." (It has happened on several occasions, so don't think we're pulling this example out of the air.) You can identify these images easily by setting up the receiver for single-signal c.w. reception — an image will come in on the "wrong" side of zero beat. (If you don't know how to set up the receiver for single-signal reception, we'll get to it a little later.)

If you are troubled with images, don't add any more tubes ahead of your receiver, for reasons to be mentioned in the next paragraph. Your best bet is to get some more tuned circuits between the antenna and the receiver — often a simple antenna coupler (as described in the *Handbook*) will improve the image rejection quite noticeably.

Perhaps you have been criticizing a powerful local ham station for "birdies" throughout the band, when investigation would show that it is caused by overloading of your receiver in the front end or in the first i.f. stage. Check on the "birdies" by using a small receiving antenna and

backing down on the "Gain" control. We know of instances where some of the older receivers that had two r.f. stages ahead of the mixer were greatly improved by removing one of the r.f. tubes and plugging in a small (5- or 10- μ fd.)



coupling condenser from grid to plate at the empty socket. The strong local signals cleaned up as if by magic, and one could copy signals a lot closer to them (frequencywise) than before.

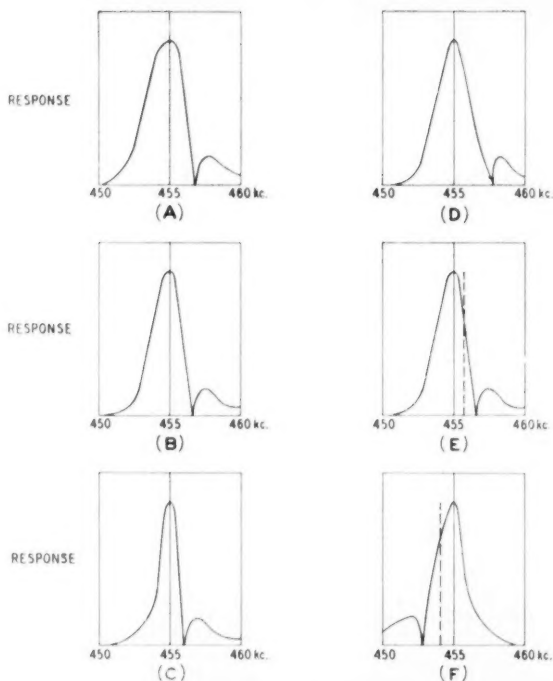
In a case like this, where you're trying to copy a signal near a really strong one, you are usually forced to resort to manual gain control, since the a.v.c. system just can't handle the situation adequately. This is especially true if the interfering signal is pulsing or syllabic in nature, like c.w. or s.s.b. An ideal receiver would have all of the selectivity between the antenna and the first tube, but of course it just can't be built that way with present techniques. Another approach would be to use transmitting-type tubes as linear amplifiers up to the high-selectivity portion of the receiver, but this hasn't found too much favor yet. It is therefore mandatory that you keep the signal levels down to some low value until you can get into the selective circuits of the i.f. amplifier. In any event, try handling strong signals with the manual gain control, and don't rely on a v.c. under all circumstances when copying a.m.

C.W. Selectivity

Some c.w. operators like selectivity, and others prefer to depend upon their ears. We aren't going to make an effort to change anyone one way or the other, but if you are one who doesn't use his crystal filter because he doesn't know how to — and you aren't alone, believe us! — we heartily recommend that you spend a little time with it. All selectivity does for you is to make the selectivity "window" quite a bit narrower, so that fewer signals can get through with any one tuning-dial setting. The crystal "notch" (adjustable through the "Phasing" control) is used to increase the rejection on one side of zero beat, so that a c.w. signal tunes from a high beat note down to zero and comes up very weakly, if at all, on the other side. This is called "single-signal reception." If the b.f.o. is set improperly you won't get it, and if the phasing notch is set wrong you won't get it well. The "Selectivity" control selects a crystal-filter bandwidth for you, from a broad one to a sharp one, and you use the setting

¹ McCoy, "Let's Listen," QST, March, 1953.

Fig. 1—Showing how the selectivity of a crystal filter changes with the setting of the selectivity and phasing controls. As the selectivity is changed, the pass-band is made narrower, as indicated in A, B and C. The phasing control changes the position of the notch, as shown in D, E and F (selectivity same as in B). The relative location of the b.f.o. frequency is shown by the dashed line in E and F.



you like or that conditions call for. But you must remember one thing — the more selectivity you use, the more carefully you must tune, because a signal won't occupy as much space on the tuning dial with selectivity as it will without. While listening to a particular signal, you can reject an interfering one by readjustment of the phasing notch if you care to, or by switching to a more selective setting and retuning the receiver a bit, to put the interfering signal "out of the window." A common error is to reserve the crystal filter

only for times when you run into QRM, but unless you know your receiver well you run the risk of losing the desired signal when you switch in the crystal filter, and it is advisable to do all of your tuning with the crystal in and set for single-signal reception.

'Phone Selectivity

The use of selectivity (crystal-filter and other) in 'phone reception is a whole article in itself, and it will be discussed at some later date.

WWV-WWVH SCHEDULES

For the benefit of amateurs and other interested groups, the National Bureau of Standards maintains a service of technical radio broadcasts over WWV, Beltsville, Md., and WWVH, Maui, Territory of Hawaii.

The services from WWV include (1) standard radio frequencies of 2.5, 5, 10, 15, 20, 25, 30 and 35 Mc., (2) time announcements at 5-minute intervals by voice and International Morse code, (3) standard time intervals of 1 second, and 1, 4 and 5 minutes, (4) standard audio frequencies of 440 cycles (the standard musical pitch A above middle C) and 600 cycles, (5) radio propagation disturbance warnings by International Morse code consisting of the letters W, U, or N, together with digits from 1 through 9, indicating present North Atlantic path conditions and conditions

to be anticipated. (See the 1953 *Handbook*, p. 466, for interpretation of forecast symbols.)

The audio frequencies are interrupted at precisely one minute before the hour and are resumed precisely one hour and each five minutes thereafter. Code announcements are in GCT using the 24-hour system beginning with 0000 at midnight; voice announcements, EST.

The audio frequencies are transmitted alternately: The 600-cycle tone starts precisely on the hour and every 10 minutes thereafter, continuing for 4 minutes; the 440-cycle tone starts precisely five minutes after the hour and every 10 minutes thereafter, continuing for 4 minutes.

Propagation notices are given during the announcement intervals at 20 minutes after and 10 minutes before the hour.

Adding a Mechanical Filter to the 75A-1

More Selectivity for a Popular Receiver

BY WARREN ANDREW,* W3AM

• If you have the yen for the excellent skirt selectivity offered by the Collins Mechanical Filter, you will be interested in reading how W3AM built a plug-in adapter for his 75A-1 receiver.¹ Undoubtedly, the idea can be extended to many other types of receivers.

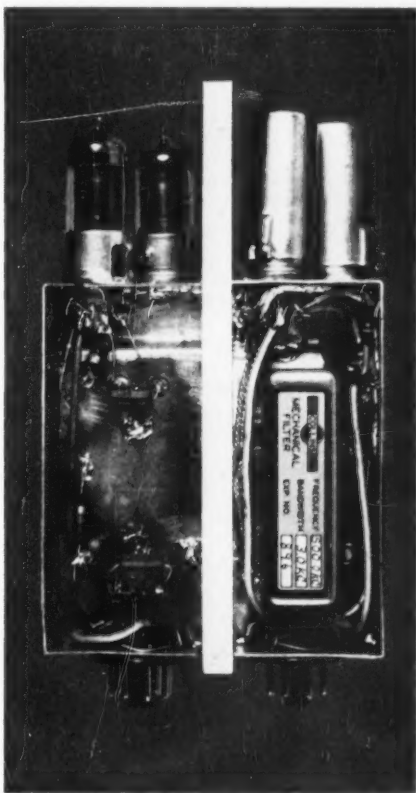
THE Collins Radio Company has just announced the availability of the mechanical filters used in the 75A-3 but centered at 500 kc., the i.f. of the 75A-1 receiver. An earlier article² outlined a procedure for using the 455-kc. filter in receivers with that intermediate frequency. It was the writer's good fortune to secure one of the 500-kc. units and, with it as a base, an adapter was made that replaces the first low frequency i.f. tube (6SG7) and, presto! the 75A-1 was transformed into a receiver equal in selectivity to the current Collins 75A-3.

The circuit (Fig. 1) is straightforward and can be put together in an evening without trouble, and without complicated tools or parts other than the filter unit itself. The two views of the adapter give a good idea of the general layout, and no trouble should be experienced by anyone building the unit. To gain fully the advantages of the filter, care should be taken in dressing the leads. All heater and d.c. leads are run close in the corner between the partition and back support on the side away from the leads coming out of the filter, and the i.f. leads are dressed out in the open except the grid lead to the second tube, which is shielded. In the adapter illustrated, this shield is a piece of RG-62/U with the outer covering stripped off to make it easier to handle. A piece of RG-58/U or RG-59/U could have been used but the RG-62/U has lower capacity. Care must be exercised in selecting the value of C_1 and C_2 since these condensers tune the input and output circuits. The writer used a value shown on the data sheet furnished with the Collins unit across the output circuit and used a variable condenser to tune the input circuit for maximum gain. This value was then measured on a bridge, and a silver-mica condenser of proper size substituted. The fixed condenser across the output was then removed and the correct value of capacitance was determined for this circuit in the same manner. The input was then rechecked to be sure an optimum had been secured. This tun-

ing process is critical and could possibly be made easier by incorporating a small variable capacitor as part of C_1 or C_2 . However, the writer felt the unit then would have been bulkier.

An effort was made to get increased plate voltage on the first tube, but to do it required changing pin connections or cutting the No. 3 pin of the 6SG7 when substituting it for the adapter. This was decided against since it was possible to get the necessary gain with the lower voltage.

There are some signals that drift around and are nearly impossible to copy with the filter in. Since most of these are DX signals (and a man has to get cards from them before he can ignore



(Right) The plug-in adapter uses two miniature tubes and a Collins Mechanical Filter — it replaces the first 500-kc. i.f. tube in a Collins 75A1 receiver; (left) The other side of the plug-in adapter.

* 3660 Southern Ave. S.E., Washington 20, D. C.

¹ Months before the Collins Company announced the availability of a somewhat similar commercial unit. — Ed.

² Brown, "Using the Collins F455A-31 Filter," CQ, March, 1953.

20th ARRL International DX Competition

'Phone: Feb. 12th-14th and Mar. 12th-14th;

C.W.: Feb. 26th-28th and Mar. 26th-28th

AMATEURS all over the world are cordially invited to take part in the 20th ARRL International DX Competition, to be held four week ends in February and March. U. S. and Canadian operators will be trying to add to their DX country totals, other stations to work needed states and provinces for their WAS and WAVE awards, and everyone to match operating skill with others in his country or ARRL section.

Two week ends are devoted to c.w. and two to 'phone operation, giving everyone a chance to

band for the 1954 contest; similarly, the VE/VO quota has been raised to eight stations. If this rules change meets with general disfavor, however, we may revert to a lower quota next year. . . . FCC-regulated U. S. amateurs are reminded that international communications are forbidden by certain countries. Contacts between W (K) stations and these "banned" countries¹ will be considered as grounds for disqualification of U. S. amateurs.

Keep your log carefully and send a copy, in the form shown, to ARRL as soon as the contest is over. Free contest forms are available from ARRL upon request. Get your station working efficiently, read the rules to acquaint yourself with the pattern, and then get set for DX galore in February and March.

Explanation of DX Contest Exchanges

Exchanges	Three-Digit Number, RST Report of Representing Power Station Worked	
	Input	
Sample (c.w.)	579	050
Sample ('phone)	57	500

participate on both 'phone and c.w. Ample "rest up" periods are provided between contest week ends.

As in the past, certificate awards are offered to the top single-operator 'phone and c.w. scorer in each country and ARRL section. A special category recognizes multiple-operator stations in those sections or countries from which three or more valid multiple-operator entries are received. Within a club, single-operator entries can compete for the club certificate awards given to the highest c.w. and 'phone scorers. A handsome gavel is also offered to the club whose members run up the highest aggregate score.

Stations outside W (K) and VE/VO will call "CQ W/VE" or "CQ TEST" and exchange serial numbers with amateurs in U. S. and Canada. The first part of the serial number indicates the RS or RST report and the last three digits the power input. Thus, if your input is 500 watts, use 500. If you run only 25 watts, your figure is 025. When your input is different on different bands, change the number accordingly, but don't worry about 0.1 per cent accuracy—the usual approximation will do.

You can try a "CQ DX" or "CQ TEST" if you're in U. S. or Canada, but past experience shows that this seldom pays off. On c.w. U. S. and Canadian amateurs have quotas, but this doesn't apply to 'phone. Amateurs overseas have no quotas; they will try to QSO as many stations in the 19 W (K) and VE/VO licensing areas as possible on each band.

W/VE c.w. men take note: The W (K) quota has been raised to six stations per country per

¹ As we go to press, prefixes to be avoided are OE (except OE13), F18, PK (except PK7), EP-EQ, HL, HS, 3W8 and XW8.

Rules

1) **Eligibility:** Amateurs operating fixed amateur stations in any and all parts of the world are invited to participate.

2) **Object:** Amateurs in the continental U. S. and Canada will try to work as many amateur stations in other parts of the world as possible under the rules and during the contest periods.

3) **Conditions of Entry:** Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Award Committee.

4) **Entry Classifications:** Entry may be made in either or both the 'phone or c.w. sections. c.w. scores are independent of 'phone scores. Entries will be further classified as single- or multiple-operator stations. Single-operator stations are those at which one person performs all the operating functions. Multiple-operator stations are those obtaining assistance, such as from "spotting" or relief operators, or in keep-

CONTEST TIMETABLE

'Phone Section:

Time	Starts	Ends
GCT	Feb. 12th 2400	Feb. 14th 2400
AST	Feb. 12th 8:00 P.M.	Feb. 14th 8:00 P.M.
EST	Feb. 12th 7:00 P.M.	Feb. 14th 7:00 P.M.
CST	Feb. 12th 6:00 P.M.	Feb. 14th 6:00 P.M.
MST	Feb. 12th 5:00 P.M.	Feb. 14th 5:00 P.M.
PST	Feb. 12th 4:00 P.M.	Feb. 14th 4:00 P.M.

The second period of this contest starts at these same hours Mar. 12th.

The second period of the contest ends at these same hours Mar. 14th.

C.W. Section:

GCT	Feb. 26th 2400	Feb. 28th 2400
AST	Feb. 26th 8:00 P.M.	Feb. 28th 8:00 P.M.
EST	Feb. 26th 7:00 P.M.	Feb. 28th 7:00 P.M.
CST	Feb. 26th 6:00 P.M.	Feb. 28th 6:00 P.M.
MST	Feb. 26th 5:00 P.M.	Feb. 28th 5:00 P.M.
PST	Feb. 26th 4:00 P.M.	Feb. 28th 4:00 P.M.

The second period of this contest starts at these same hours Mar. 26th.

The second period of this contest ends at these same hours Mar. 28th.

LOG, 20th A.R.R.L. INTERNATIONAL DX COMPETITION

Sheet 1 of 1 Call ARRL Section or Country

Date & Time	Station Worked	Country	Record of New Countries for Each Band						Serial Numbers		Points
			3.5	7	14	21	27	28	Sent	Received	
Feb. 12 0005 GCT	VP9BDA	Bermuda			1				56375	57080	3
Feb. 13 1300	PA0GN	Netherlands						1	56375	47075	3
1306	G3COJ	England						2	56375	46150	3
1345	PA0RA	Netherlands						2	56375	59080	3
2030	LU1DDV	Argentina						3	56375	57750	3
2310	VP9X	Bermuda			1				57500	56050	3
Mar. 12 1020	ZL1MR	New Zealand			2				58500	58075	3
1035	VK2JZ	Australia	1						47500	46100	3
1105	VK2RA	Australia	1						46500	45100	3
1421	PA0LQ	Netherlands						3	45375	57100	3
Mar. 13 0925	TF3EA	Iceland			3				57500	57050	3
1245	G2PU	England						3		46125	2
1255	G3DO	England						3	56375	57100	3
1350	G2PU	England						3	57375		1
1430	G5BA	England						3	46375	55100	3
2320	KZ5AW	Canal Zone			1				58500	58500	3

Sample of report form that must be used by foreign c. w. and all 'phone participants.

ing the station log and records. A special 'phone listing is available for those entrants whose work is exclusively in the 10- and/or 11-meter bands.

5) Contest Periods: There are four week ends, each 48 hours long: two for 'phone work and two for c.w. The 'phone

section starts at 2400 GCT, Friday, February 12th and Friday, March 12th, ends 2400 GCT, Sunday, February 14th and Sunday, March 14th. The c.w. section starts at 2400 GCT, Friday, February 26th and Friday, March 26th, ends 2400 GCT, Sunday, February 28th and Sunday, March 28th.

6) Valid Contacts: In the 'phone section, all claimed credits must be made voice-to-voice. In the telegraph section, only c.w.-c.w. contacts count. Crossband contacts may not be counted.

7) Exchanges: Each participating operator will use three figures to represent the approximate transmitter power input. C.w. contestants will exchange six-figure numbers, each consisting of an RST report plus the three "power" numbers. (Examples are given in the sample log.) 'Phone contestants will exchange five-figure numbers, each consisting of a Readability-Strength report plus the three "power" numbers. If the input power varies considerably on different bands, the "power" number should be changed accordingly.

8) Scoring:

a) Points: One point is earned by a W (K) or VE/VO station upon receiving acknowledgment of a number sent, and two points upon acknowledging a number received. Two points are earned by any other station upon receiving acknowledgment of a number sent, and one point upon acknowledging a number received.

b) Final Score: W (K) and VE/VO stations multiply total points earned under Rule 8(a) by the number of countries worked on one band plus the number of countries worked on each other band. All other stations multiply total points earned under Rule 8(a) by the sum of the number of W (K) and VE/VO licensing areas worked on one band plus

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Sample of report form that must be used by W/VE c.w. participants. When a station is worked for less than the maximum number of points allowed (as for example the contact with G2MI shown at left), the additional contact to make up the points not earned in the first contact should be entered at the bottom of the sheet. Canadian entrants should allow two blocks for each country, but may record no more than eight contacts therein. A separate set of sheets should be used for each band.

LOG, 20th INTERNATIONAL DX COMPETITION					
Call		ARRL SECTION			
Band	14 Mc.	Sheet	1 of 3		
Country	Station Worked	Date	Time (GCT)	Number Sent	Number Received
Netherlands	PA0GN	2 26	1300	589450	479075
	PA0RA	2 26	1345	569450	579080
	PA0LQ	3 27	1421	459450	578100
England	G6CL	2 26	1306	589450	469150
	G2MI	2 27	1245		469125
	G3KP	2 27	1255	569450	579100
	G5BA	3 26	1430	469450	559100
	G6ZO	3 27	1822	579450	589125
	G5RI	3/27	1851	469450	459075
	G2MI	2 27	1350	579450	

the number of W (K) and VE/VO licensing areas worked on each other band.

Countries will be those on the ARRL Countries List. There are 19 licensing areas: 10 in the United States, 9 in Canada (VO VE1-VE8). [See Countries List on p. 61—Rb.]

9) **Repeat Contacts.** The same station may be worked again for additional points if the contact is made on a different frequency band. The same station may be worked again on the same band if the complete exchange for a total of three points was not made during the original contact on that band.

10) **Quotas:** The maximum number of points per country per band which may be earned by W (K) stations in the c.w. section is 18, and contacts made on the same band with the same country after the quota is filled will not count. Thus complete exchanges with 6 stations in one country on one band fill the band quota for that country. The maximum number of points per country per band which may be earned by VE/VO stations in the c.w. section is 24, and contacts made on the same band with the same country after the quota is filled will not count. Exchanges with 8 stations in one country on one band are thus permitted Canadian participants. There is no quota for stations in the c.w. section outside of the U. S. and Canada. There is no quota for any station in the 'phone section.

11) **Reporting:** Contest work must be reported as shown in the sample form. Each entry must include the signed statement as shown in that example. Contest reports must be mailed no later than April 30, 1954, to be eligible for QST listing and awards. All DX Contest reports become the property of the American Radio Relay League. No contest reports can be returned.

12) **Awards:** To document the performance of participants in the Twentieth ARRL International DX Competition, a full report will be carried in QST. In addition, special recognition will be made as follows:

a) A certificate will be awarded to the high scoring single-operator 'phone and to the high-scoring single-operator c.w. entrant in each country (as shown in the ARRL Countries List) and in each of the 73 U. S. and Canadian ARRL sections (see page 6 of this issue) from which valid entries are received. In addition, a certificate will be awarded to the high scoring multiple-operator station in each section or country from which three or more valid multiple-operator entries are received.

b) A suitable certificate will be awarded to the operator making the highest single-operator 'phone score in each ARRL-affiliated club, provided the club secretary submits a listing of a minimum of three 'phone entries by bona fide resident members of such club, and provided further that these scores are confirmed by receipt at ARRL headquarters of the individual contest logs from such members. The highest single-operator c.w. scorer in each club will be awarded a certificate under the same conditions.

c) ARRL will award a gavel to the affiliated club submitting the greatest aggregate 'phone and c.w. score by bona fide resident club members, whether singles or multiple-operator entries, provided such scores are confirmed by receipt at ARRL headquarters of the individual contest logs from such members.

13) **Judges:** All entries will be passed upon by the ARRL Award Committee, whose decisions will be final. The Committee will void or adjust entries as its interpretation of these rules may require.

14) **Disqualifications:** Each participant agrees to observe the contest rules as well as all regulations established for amateur radio in his country. Some examples of grounds for disqualification are: Off-frequency operation as confirmed by a single FCC citation or advisory notice or two ARRL-accredited Official Observer measurements; low tone reports in logs; working countries on the "banned list" footnote information applies to U.S.A. amateurs only.

SUMMARY, 20th A.R.R.L. INTERNATIONAL DX COMPETITION

..... Entry Call ARRL Section or Country

(C.W. or 'Phone)

Name Address

Transmitter Tubes,

Receiver, Antenna(s),

(Logs from W(K) and VE/VO show number of foreign countries worked. Logs from other countries show number of U.S.A. and Canadian call areas worked.)

Bands	3.5 Mc.	7 Mc.	14 Mc.	27 Mc.	38 Mc.	Total
No. Countries QSO'd	1		4		3	*8
Number of Contacts						15

Number of Different Countries Worked Number of Hours of Station Operation

Assisting Person(s); Name(s) or Call(s)

45 8 560

(Points) × (Multiplier) = FINAL SCORE

Participation for Club Award in the (Name of Club)

I certify, on my honor, that I have observed all competition rules as well as all regulations established for amateur radio in my country, and that my report is correct and true to the best of my belief. I agree to be bound by the decisions of the ARRL Award Committee.

Operator's Signature

* Figure in this box is multiplier.

Sample of summary sheet that must accompany all reports.

A Basic Tool Kit for the Novice

What Tools Should a Newcomer Buy?

BY LEWIS G. MCCOY,* WHICP

WHEN a newcomer starts out in amateur radio, he soon finds that one of the "must" items around the ham shack is a good set of tools. Whether he is building gear or maintaining his present equipment, there will be special tools, particularly suited to radio work, that he'll be needing in his tool box. He may get by for a while using a pair of scissors for wire cutters, or the family carving knife for wire-stripping, but sooner or later he'll find these makeshift substitutes are inadequate for the job.

When that time comes, he is confronted with the problem of exactly what kind of tools he should buy. For example, there are many types and sizes of soldering irons. Each one has its own particular applications, so one of the right shape and heat capacity for a certain job can be a great convenience. Knowing what to buy will save the Novice considerable time and expense. What we hope to do here is to pass along some worth-while tips on what tools to buy and how to use them.

There is a saying that, "You only get what you pay for." This is certainly true when it comes to buying tools. We don't mean that you should buy gold-plated soldering irons or diamond-studded pliers, but you should make it a point to get tools that are made by reputable manufacturers.

The first item on the list should be a soldering iron. The iron to use for general radio work is a 60- or 100-watt job with a $\frac{3}{8}$ - or $\frac{1}{4}$ -inch tip (such as the Drake model 400 we use here in the laboratory). If you buy an iron with a larger tip, you'll find there will be many places around a chassis you won't be able to reach. Larger-sized

irons and tips are needed when doing sheet-metal work or when it is necessary to transfer a great amount of heat to the work.

There are a few points to remember when soldering. Always use rosin-core solder for radio work, never acid-core. Be sure the tip of the iron is clean of scale and dirt. Constant use of an iron causes the tip to get scaly and it then becomes difficult to transfer heat to the work. The tip can be kept clean by wiping it with a rag or steel wool whenever it appears to be getting dirty or just before putting it away after a soldering session. If the tip should become badly pitted or coated with thick scale, it must be filed clean and re-tinned. "Tinning" is the process of flowing solder and flux on a hot clean iron to give a thin coating of solder. An untinned iron will not work.

When soldering, the hot tip of the iron is held in contact with the work until the work is hot enough to melt the solder. This is the most important point to remember when soldering — the work should be hot enough to melt the solder. When soldering small condensers, resistors or germanium, too much heat can damage them, so the lead being soldered should be held by a pair of pliers, at a point between the unit and the point being soldered. The pliers will absorb the heat that would otherwise injure the unit.

By always observing the rule that work should be hot enough to melt the solder, and the obvious one that the work must be clean before soldering, you will never have trouble with "cold-solder" connections, a frequent bugaboo in radio work. A cold-solder connection may look good to the eye but may not be a good electrical connection. In time it is almost certain to give trouble. The ap-

* Technical Assistant, QST.

Here is a representative group of the tools needed in a radio amateur's tool box. They include hand drill, twist drills, knife, scale, screwdrivers, soldering iron, solder, soldering aid, files, hammer, pliers, center punch and brush.



Basic Tool Kit

Electric soldering iron, 60 to 100 watts
Solder (rosin-core)
Long-nose pliers, 6-inch
Diagonal cutting pliers, 6-inch
Soldering aid (Hytron)
Screwdriver, 6- to 7-inch, $\frac{1}{4}$ -inch blade
Screwdriver, 4- to 5-inch, $\frac{1}{8}$ -inch blade
Hand drill, $\frac{1}{4}$ -inch chuck or larger
Drills, $\frac{1}{8}$ - and $\frac{1}{4}$ -inch, and Nos. 18, 28 and 33
Pliers (combination)
Pocketknife
Two large coarse files, one flat, one rattail
Two small files, one flat, one round
Keyhole saw (metal-working)
Hammer
Center punch
 $\frac{1}{4}$ -inch socket punch
Small paintbrush
Reamer Carpenter's brace

proved practice in many commercial applications is not to depend upon solder for any mechanical strength at all but only for a low-resistance electrical connection. The strength is obtained by wrapping the wire around the terminal to be soldered. Which brings us to the next tool, or rather, tools needed in our kit, long-nose pliers and diagonal-cutters.

When wrapping wires around terminals or when making connections to points that are difficult to reach, long-nose pliers are a radioman's "must." Long-nose pliers are available with or without wire cutters at the base of the jaws. The cutters are of little help in cutting wires close to sockets or the chassis, but often wires will be easy to reach, and having the cutters on the long-nose pliers will save time. The cost difference between pliers with and without cutters is so slight that it is worth while to purchase those with the cutters.

When wrapping wire around terminals and then soldering, many times there are short lengths of wire protruding that must be snipped off. This is done with a pair of diagonal-cutters. With these it is possible to reach into very cramped spaces and cut wires. The three tools listed, a soldering iron, long-nose and side-cutting pliers, together with a screwdriver, are probably the most important that the amateur uses. When you purchase these items, obtain tools of a reputable brand.

In addition to the tools mentioned above, another soldering and wiring tool worth mentioning is the Hytron soldering aid. This is a very inexpensive gimmick that has one pointed end, and the other end is a two-tined fork for twisting wires around joints. The pointed end comes into use for loosening blobs of solder, separating leads, etc.

Speaking of loose blobs of solder, a cheap paintbrush makes an excellent clean-up tool for removing bits of loose matter from a chassis or for brushing out dirt.

Small holes in metal and some insulating materials are drilled with twist drills and a hand drill. Most hand drills will only take drills up

to $\frac{1}{4}$ -inch diameter, and one has to look for other methods if larger holes are involved. For holes up to $\frac{1}{2}$ -inch, a common method is to start the hole with a small twist drill and the hand drill, and then finish with the large drill held in a carpenter's brace. Another, and perhaps preferable, method is to use a reamer held in the carpenter's brace. For still larger holes, such as the $\frac{3}{8}$ - and $\frac{1}{2}$ -inch holes for miniature sockets and the $\frac{1}{8}$ - and $\frac{1}{4}$ -inch holes for bakelite and ceramic octal sockets, radio chassis punches are recommended. These punch out a clean hole as a bolt is tightened, and they work beautifully in the materials normally used for chassis material.

A hack saw, large coarse flat file, and rattail file also are helpful for cutting and enlarging holes on a chassis.

In addition to the tools outlined above, the table shown in this article gives the contents of a basic tool kit for the ham. An electric hand drill is a luxury unless one is doing considerable work in iron and steel, as in building an antenna tower, where it becomes a "must." However, the tools described in this article will prove to be adequate for most jobs the newcomer encounters.

Recommended reading for the beginner is the "Construction Practices" chapter in *The Radio Amateur's Handbook*. This chapter describes in detail such things as chassis-working, useful materials to keep on hand, making rectangular holes, and many other operations in construction work.

CALLING ALL NOVICE HAMS

The Novice Round-up makes its third annual appearance this year January 9th through 24th. Old-timers are invited to join in the fun and give the newcomers contacts.

Full details appeared in December *QST*, but as a reminder, don't forget that the Round-up starts on Saturday, January 9th, at 6:00 P.M., local time and ends on Sunday, January 24th, 9:00 P.M. local time. A time limit of forty hours is available. This can be used any way you prefer in operation on 80, 40, 15 and 2 meters.

You've still time to get extra scoring credits by qualifying in the Code Proficiency Run from WIAW on January 13th, or from W6OWP on January 8th. In the meantime, send in to ARRL Headquarters for your free map of the United States, a contest log and reporting forms for the Novice Round-up. The fine outline map can be posted in your shack to keep a visual check on your worked-all-states progress.

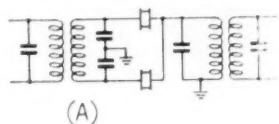
Remember to read December *QST* again for full details on rules.

• Technical Topics — Circuit Diagrams

A LARGE percentage of amateurs (and engineers) pass off a circuit diagram as simply a graphical record of how a particular piece of radio gear is wired, and they pay little or no attention to how it is drawn. In a complicated receiver or multistage transmitter this can lead to a terrific hodge-podge of tubes, resistors, condensers, coils and wires that is often impossible to follow without resorting to a pointer or pencil. In many cases a circuit diagram is also used to indicate the operation of some electronic device, and a properly-drawn circuit can make the action much more obvious or easy to follow. It is the purpose of this squib to point out a few simple considerations in laying out a circuit diagram that will be easy to follow and understand. Not that a diagram is incorrect if the connections are accurate but the thing is laid out poorly, but it can be made easy or difficult to understand simply by the way it is arranged.

We make no claim to being the only ones conscious of this problem, but it is surprising how little has been published on the subject. The only thing we have seen in recent years was in a British publication,¹ although we know that the subject is occasionally kicked around by some engineers, draftsmen and servicemen. A draftsman can't be held responsible for making a

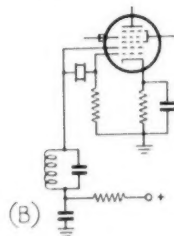
by anyone interested in the technical end of things. The one at A is a "half-lattice" crystal filter. No, it's different, because C is in series with L . Oh, no, it's not really in series with L — it just looked that way at first glance. That circuit at B is the oscillator section of a crystal-controlled converter. But what kind of an oscillator circuit is it? Oh, yes, it has a tuned circuit in the anode grid, with the crystal between control and anode grids. Notice that in each case



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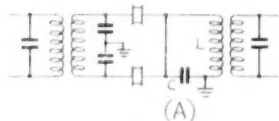
(A)

Fig. 2.



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(B)



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(A)

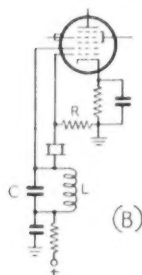


Fig. 1.

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(B)

diagram easily readable, because usually he is not a technical man, and it does take technical know-how to make an easy-to-read circuit diagram.

Just in case you are already disagreeing with our thesis and are thinking that it doesn't make any difference how a circuit is drawn, let's take a couple of examples. Fig. 1 shows two sections of circuits that should be immediately identifiable

you have to stop and figure out just what the circuit is. Now compare these two with the circuit segments shown in Fig. 2. The connections are identical to those in Fig. 1, but they are laid out so that you can see immediately what's going on. Figs. 2A and 2B are easier to read.

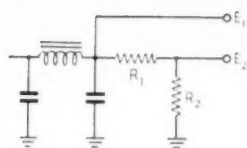
Notice that the LC circuit in Fig. 1B has four leads running away from it, while the same circuit in Fig. 2B has only two. This latter method of connecting to an LC circuit usually results in less confusion, although it is a fine point in some instances.

Dividers vs. Couplers

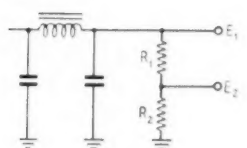
Let's consider another principle that comes up often in drawing a circuit. Fig. 3A shows a section of a power-supply filter, and Fig. 3B shows the same circuit redrawn in a slightly different manner. From 3B it is immediately apparent that R_1 and R_2 make up a voltage divider — it is not obvious at all from Fig. 3A. From this we can devise the rule that dividers (resistive or capacitive) should be drawn along the same line (preferably in a vertical line) across the source voltages they are splitting.

When you run up against a coupling condenser and a resistor return, as in Fig. 4A, it should be drawn as shown, since the horizontal line either side of the condenser implies a coupling from left to right. But if the condenser is not strictly a coupling device (as would be the case where it is

¹ Williams, "Functional Circuit Diagrams," *Wireless World*, Jan., 1953.



(A)

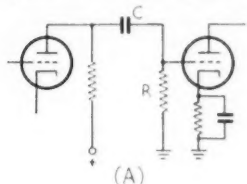


(B)

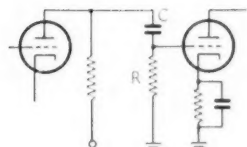
reactance is high by comparison with the value of R , thus dropping the voltage appreciably to the grid) then its function becomes more apparent if the circuit is drawn as in Fig. 4B. This is a similar principle to that of the divider circuit of Fig. 3B.

Voltage Levels

Fig. 4B illustrates a point that is controversial and is represented by two schools of thought. Many engineers and some periodicals and books would have drawn Fig. 4A as shown in Fig. 5. You can see that the difference is in the location of resistor R and the $+$ terminal. The thinking behind this principle is that, as closely as can be followed, the highest positive potential should appear at the highest point on the diagram, and



(A)

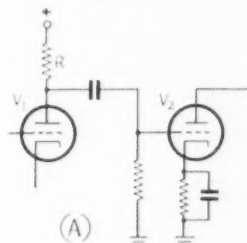


(B)

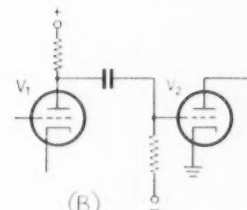
the lowest potential should appear at the lowest point. Thus, if a negative bias were applied to V_2 , the circuit would be drawn as in Fig. 5B. This is often a useful device in complicated circuits, but it cannot be followed completely without running into difficulties. For example, since the grid resistor of V_2 (Fig. 5B) has no d.c. drop

across it, the grid resistor should be drawn horizontally, the grid should be drawn below the cathode, and — well, you get the idea. However, if the principle is applied only to supply terminals and plate circuits, it works out nicely.

The alternative procedure, that of showing supply terminals and busses below the tubes and other more important components in a circuit, is the one most commonly used by *QST*. However, you can find some examples in past issues of the first method being partially applied



(A)



(B)

In cases where two or more parallel channels are involved, the vertical voltage scale is repeated for each channel.

Crossovers and Long Leads

Anyone who has ever perused a few circuit diagrams has undoubtedly run across the confusion introduced by long leads running all over the page. Some of the receiver instruction manuals are particularly guilty of this — it's almost as though they didn't want you to be able to follow the diagram. You think we're kidding? Then look in your own receiver's instruction book and see how many times the writer of the book will break down a portion of the complete circuit to discuss some particular feature, like a noise limiter or a tuning circuit.

To our knowledge, the only solution to the long-leads problem that has been found is the simple one of not running them. These leads are usually common-voltage busses, so all you have to do is to terminate them with the voltage that they get from the power supply or other source. An example of this can be found on pages 26 and 27 of the March, 1953, issue of *QST* — that circuit would really be a mess if the common-voltage leads had to be snaked past the other components. In a one- or two-tube unit, the principle can be ignored, of course.

In the matter of crossovers, there are again two schools of thought. A common practice in

industry is to show a connection with a dot and no connection with no dot, as in Fig. 6A. This developed quickly during World War II, since it saved the draftsman's time not to make the crossover loop of Fig. 6B. Admittedly, it is fast, but it is more prone to error than the method of Fig. 6B, because leaving out the dot means no connection at the required point. *QST* uses the second method, as better insurance against errors and for, we think, better readability.

But regardless of which method you prefer, a good rule to follow in any diagram is to hold the number of crossovers down to a minimum, because this makes for a cleaner and easier-to-follow diagram. Following the short-leads principle outlined above does this automatically to some extent, and a little thought in laying out the circuit will reduce the crossovers still further. One dodge that accomplishes this readily when dual tubes (such as dual triodes, diode-triodes,

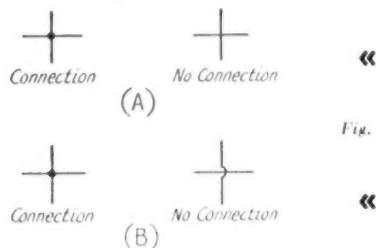


Fig. 6.

etc.) are used is to divide the tubes and draw them separately. This is illustrated in Fig. 7. Fig. 7A is a somewhat common way of presenting a dual triode (in this case used as a speech amplifier). Dividing the sections, as in Fig. 7B, eliminates the crossovers and makes the functions of all components immediately apparent.

The general practice in laying out a diagram is to run from left to right. In a receiver diagram, this means r.f. input at the left and audio output at the right. In audio work, signal input at the

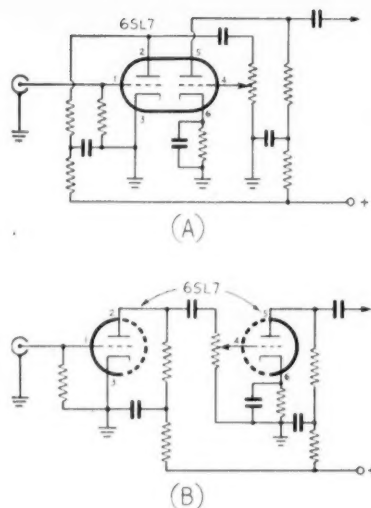


Fig. 7.

left and output at the right. In a transmitter diagram, put the frequency-determining portion on the left and the output circuit on the right. It all follows logically from our left-to-right reading habits — this discourse isn't intended to point out principles for Chinese circuit diagrams.

Heater and filament leads usually can be eliminated or, as is done in some *QST* diagrams, drawn separately in another part of the diagram.

Now that we have passed along a few simple principles for drawing circuit diagrams, you might try out a few of them in your spare time. And just when you think you're getting good, draw a *clean* push-pull cross-neutralized triode amplifier. That's one that has had the experts stumped for years!

— B. G.

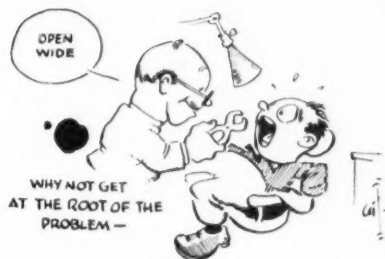
Standing Waves and TVI

FROM the beginning of TVI standing waves on the transmission line have come in for a share of the blame. This gossip probably started when somebody matched up his antenna system and found that afterward his TVI was less — which might very well happen, although the relationship between the standing waves and the TVI was purely coincidental and both were effects rather than causes. But since most of us are pretty expert conclusion-jumpers, and since only two things were visible, one had to be the cause and the other the effect; ergo, standing waves cause TVI, since it is obviously ridiculous to say that TVI causes standing waves.

Why not get at the root of the problem? Let's ask ourselves, "How can standing waves cause TVI?" The standing waves everyone has in

mind are those set up at the *operating* frequency. Do such standing waves have harmonic off-shoots? No, because the antenna system is composed of ordinary conductors, and ordinary conductors do not have the ability to generate





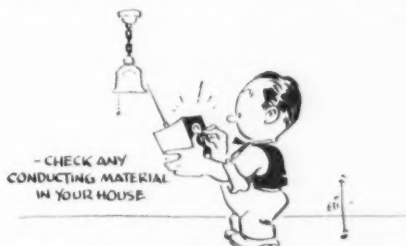
anything, including harmonics — it takes a rectifier or other "nonlinear" circuit to do that. Supposing the transmitter itself to be completely free from harmonic output, then what possible effect could the standing waves at the *fundamental* frequency have on harmonic TVI? And if they don't have any effect under such conditions, is the situation any different if the transmitter *does* have harmonic output? No, these standing waves can't possibly "cause" harmonics.

Well, then, maybe it's because the transmission line radiates power at the fundamental frequency when there are standing waves, and it is the fundamental power that is getting into the TV receiver and causing the trouble. Here we come to another well-established fallacy — that a high standing-wave ratio means lots of radiation from the line. With the close conductor spacing used by amateurs the line radiation, for any standing-wave ratio, is negligibly larger than the radiation from the same line when it is perfectly matched. With coax lines, of course, the radiation has to be practically nil under any circumstances because the outer conductor is an excellent shield for the inner one.

On the other hand, "everybody knows" that there can be lots of radiation from a transmission line. However, it is not caused by the standing waves we have been talking about. It is caused by an entirely different collection of standing waves that have nothing to do with the "regular" ones. These standing waves — it would be more accurate to say "current," because whether or not it flows in such a way as to form standing waves isn't too important, but the fact that a current does flow at all is important — can be gathered loosely under the general heading of "unbalance." The term is somewhat misleading (although visible evidence such as meter readings shows that the currents in the two line conductors are not balanced) because it implies, in most hams' minds, that the

line itself is in some way unbalanced — such as one wire having more capacitance to ground than the other, and similar mechanical defects. These do occur, but in all but a very few cases their effect is quite minor.¹

The principal cause of the unbalance current is the thing that makes the line necessary in the first place — the antenna. The antenna radiates energy, and since the transmission line is close at hand it picks up quite a lot of the radiated energy. This flows down the line and gets all over the transmitter, the a.c. line, and any other metals in the vicinity (as a matter of fact, it does so whether or not it flows on the transmission line. All you have to do to prove it is check any conducting material in your house with a crystal wavemeter — with the transmitter turned



on, of course). Some of it gets radiated from the line and other conductors; quite a lot, if the whole system — antenna, transmission line, transmitter, a.c. line and all — happens to be resonant or nearly resonant as a grounded "Marconi" antenna at the operating frequency. This happens oftener than you might think. It doesn't matter much whether the line is open wire or coax; the current flows on the *outside* of coax.

A better match between the antenna and transmission line may reduce this "unbalance" — accidentally. The changes you make in bringing about a match may detune the "Marconi" so less current can flow. *Anything* that will reduce the stray coupling between the antenna and the line will help. Just like the coupling between tuned circuits, the coupling between the line and antenna can be decreased either by positioning the secondary circuit (the line, in this case) so minimum energy is transferred, or by detuning the secondary — which means, here, detuning the "Marconi" to make it resonate far enough away from the operating frequency so that little energy will be accepted. The details are given a fairly lengthy treatment in the *ARRL Antenna Book*.

So, whether the antenna is matched to the line or not has comparatively little to do with the question. The standing-wave ratio, as we ordinarily think of it, is not guilty of causing appreciable line radiation. Changes in the system that affect one may, and probably will, affect the other, but sometimes they may go together and sometimes they may take opposite directions.

But that's not all — there's a third point in

(Continued on page 128)

¹ It is easy, in principle, to demonstrate this experimentally, and the writer has done it a number of times, although the experimental set-up is not always convenient to make. It requires first checking the unbalance with the antenna connected to the line, and then making a second check with a dummy antenna substituted for the actual antenna, without changing the position of the line itself. The dummy must, of course, have the same impedance as the actual antenna. It is invariably found that the line balance is very good when the non-radiating antenna is used, showing that the unbalance arises only when the line is immersed in the field of the radiating antenna.

On the Air with SINGLE SIDEBAND

Using the Viking II as a Linear Amplifier

Currently the hottest news making the rounds of the single-side bands is the word that the Viking II can be used as a linear amplifier on both 75 and 40 meters without modification. W4JMU was the first to try it—he has a homemade phasing rig with 6AG7 output. The s.s.b. signal is introduced at the "VFO" socket, and the Viking is switched to "C.W." and "VFO." The stages can be tuned by injecting carrier from the s.s.b. exciter. W4JMU then

talks into the mike and backs off the "Drive" control of the Viking until no grid current is indicated, even on voice peaks. The output loading is adjusted so that the voice peaks kick the indicated plate current up to about 240 ma. Naturally the best checks on loading can only be made and confirmed with the help of a scope, if one is looking for maximum undistorted output.

Both W4JMU and W0GPT (who drives his Viking II with a Central Electronics 10A exciter) report that the oscillator current in the Viking runs high if nothing else is done, but it is a simple matter to plug in a 500-ohm cathode resistor at the key jack and bring the current down to around 8 or 9 ma.

All this doesn't mean that linear amplifiers are no longer needed for s.s.b.! What it does mean is that W4JMU found that the biases and frequency sequence in the Viking II permit its use as a linear. You can't use a rig where frequency multiplication is involved, and you can't use a rig (without modification) in which some of the amplifier tubes are biased to cut-off or beyond or, on the opposite end of the scale, would run into grid current. The tubes in the Viking are running Class A or AB₁ under the above conditions.

Selectable Sideband with VFO and a Filter-Type Generator

Jim Freund, W5QMI, has been kicking this s.s.b. stuff around a bit, and he passes along what looks like a good idea. As you know, one of the problems with a filter-type s.s.b. generator is in devising a method for selecting either sideband in the output. If the filter is one that has a characteristic steeper on one side than on the other, as many of them do, it is desirable to keep the (suppressed) carrier always on the same side of the filter. W5QMI's system, shown in Fig. 1, allows you to do just that. The output from the VFO (the actual operating frequency) is mixed with a signal from the filter-frequency oscillator. The sum or difference beat is selected, depending upon the sideband to be used

in the amateur band, and this is used to heterodyne the low-frequency s.s.b. signal to the operating frequency. The output of the second mixer can, of course, be ganged to the VFO. There are several advantages to the system: only one crystal oscillator is required, an operating-frequency VFO can be used and it sets the stability of the system, only one sideband filter is required but choice of sidebands is available, VFO output is available for carrier reinsertion at receiver, "best" side of filter is always used.

Fig. 2 shows a suggested low-frequency s.s.b. generator, using the Collins mechanical filter or a crystal-lattice filter, that would be applicable in such a system. — B. G.

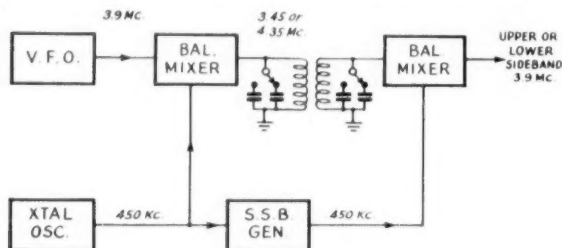


Fig. 1 — Block diagram of a heterodyne method for selecting upper or lower sidebands with a filter-type s.s.b. generator. This method has the advantage over changing the modulated-carrier frequency in that the modulated carrier is set up once for best filter action and left there.

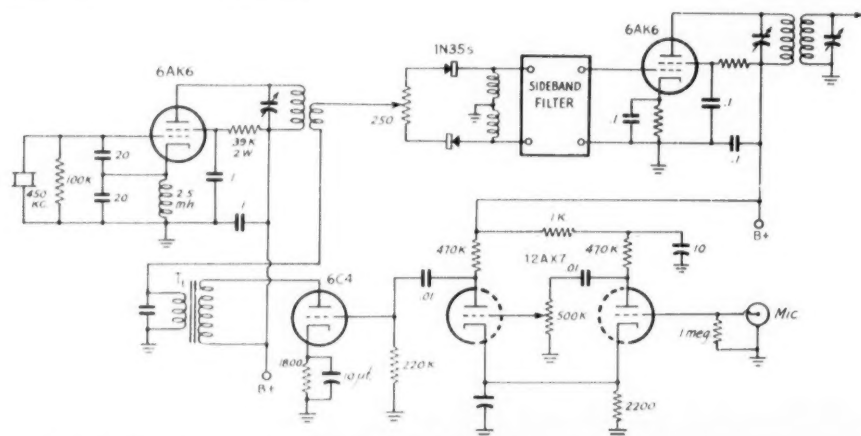


Fig. 2 — A modulator circuit for use with the Collins mechanical filter. T_1 is a small universal output transformer.

NEW BOOKS

Ultra High Frequency Propagation, by Henry R. Reed and Carl M. Russell. 562 pages, 264 figures, 6 x 9 inches. Published 1953 by John Wiley & Sons, Inc., New York, and Chapman & Hall, Ltd., London.

As anyone who has tried to read or listen to technical papers dealing with this field knows, the science of wave propagation has developed a language of its own. Terms from other sciences, plus the specialized descriptive words that have been applied to recent results of propagation studies, leave the lay reader far behind.

Though the treatment in this book is technical, and largely mathematical, it covers a great deal of ground in understandable fashion. Its introductory chapter will help the reader to make use not only of what comes later in the book, but much of what he will encounter in u.h.f. propagation literature generally.

Author Reed is Professor of Electrical Engineering at the University of Maryland, and Consultant to the Navy at its Air Test Center, Patuxent River, Maryland. Coauthor Russell is Chief Engineer, Electronics Test Division, at Patuxent River, and a long-time ham, having held the calls W9JGA and W1KKF.

Other u.h.f. and microwave books received in recent months include:

UHF Practices and Principles, by Allan Lytel, published by John F. Rider, Inc., New York, and **Essentials of Microwaves**, by Robert B. Muchmore, John Wiley & Sons, Inc., and Chapman & Hall.

The first is a practical treatment of the equipment side of the u.h.f. field. The latter deals with both theoretical and practical aspects of microwaves, tying in microwave theory with the fundamental electromagnetic laws of Maxwell and others. Equipment is discussed in some detail and recent developments in the microwave relay and radar fields are covered.

— E. P. T.

Silent Keys

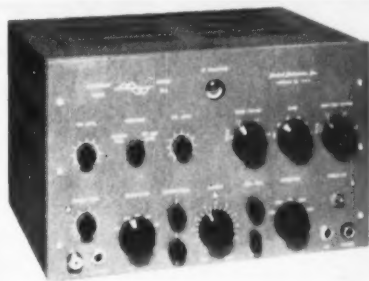
It is with deep regret that we record the passing of these amateurs:

W1HRF, Frederic M. Gibson, Wollaston, Mass.
W1MWU, Wilhelmina W. Martin, Lincoln, Mass.
W2BWR, James V. Gartland, Brooklyn, N. Y.
W2GJF, Theodore Genpp, jr., Wood Ridge, N. J.
W3GN, Edward J. Eckert, Glenshaw, Penna.
W3JB, William N. Wilson, Media, Penna.
W1CMA, Gary C. Hunt, jr., Cedarhurst, Ga.
ex-4HS, V. B. Bayless, Atlanta, Ga.
W1PJJ, Joseph T. Gafford, College Park, Ga.
W5EAK, Milo F. Hawkins, South Coffeyville, Okla.
W5NUE, M/Sgt. Rawleigh D. Jones, Albuquerque, N. Mex.
W5ORV, Lawrence V. Grant, Albuquerque, N. Mex.
W6RHC, Nola O. Dixon, Chico, Calif.
W6SF8, Dean E. Jackson, Sausalito, Calif.
W7MZE, Lt. Cmdr. Mirl Thompson, USN, Seaback, Wash.
W7OZZ, John T. Manis, Spokane, Wash.
W8EQ, James C. Lisk, Lima, Ohio.
W8US, Melvin Z. Vickers, Columbus, Ohio.
W9DEQ, Glenn H. Cunningham, Bolivar, Mo.
W9ZRT, Harold B. Love, Mandan, N. Dak.
11FR, Aldo Romanin, Trieste

New Apparatus

The 20A S.S.B. Exciter

Followers of single-sideband techniques will be interested in the new 20A s.s.b. exciter, a huskier and more elaborate version of the well-known 10A exciter. The 20A is completely band-switched (160 through 10), and a pair of 6AG7s in the output stage deliver 20 watts peak output, sufficient to work directly into an antenna or drive a big linear amplifier. As in the 10A, the s.s.b. signal is generated at 9 Mc. and heterodyned to the desired amateur band. A crystal socket is provided for crystal-controlled operation, or VFO operation can be obtained by running Command transmitters (BC-457, etc.) at



low power and using them for frequency control. (A socket at the rear of the unit accepts the VFO signal and also makes plate power available for running the VFO.) Complete instructions on how to use or modify Command transmitters are furnished.

All the features of the 10A are retained, such as voice-operated break-in, selectable sideband (with or without carrier), blocking bias for the linear amplifier, and provision for operating c.w. break-in and regular a.m. and p.m. New features include a speech-level control calibrated in 6-db. steps, a "magic eye" carrier-null and peak-output indicator, a carrier-level control that inserts carrier without disturbing the carrier-balance adjustments, and a "calibrate" circuit that provides maximum ease of setting the transmitter frequency to a desired spot in the band.

The 20A is available in three styles: gray table top (as in the photograph), and gray or black relay-rack mounting. The table-top unit is 14³/₄ wide by 8³/₄ high by 10 inches deep—all units are complete with power supply and tubes.

The 20A exciter (table-top model) sells for \$249.50 wired and tested, or \$199.50 in kit form with complete instructions and wiring harness. It is made by Central Electronics, Inc., 2125 West Giddings St., Chicago 25, Ill.

— B. G.

Strays

G3IDG knows an avid ham (G2VK) named Willingham who lives in Tottenham.

YL NEWS and VIEWS

BY ELEANOR WILSON,* W1QON

Last Spring the YLRL sent questionnaires to all its members. While the majority of questions pertained primarily to that organization, some were general enough to be perhaps of interest to non-YLRL members too.

From 388 members 175 replies were returned, and percentages are based, of course, on the replies returned. Here is some of the information (tabulated by W3MSU and W3OQF) for whatever it may be worth:

- 90% — are married
- 78% — have OMs who are also licensed
- 19% — build their own gear regularly (an additional 15% build occasionally)
- 40% — operate 'phone only
- 14% — operate c.w. only
- 44% — operate both 'phone and c.w.
- 64% — favor a "national YL convention," with the majority feeling that it should be held in conjunction with an ARRL convention

Actually, the above figures are based on a small fraction of the total number of YLs in the world, but they probably represent a fair cross-section.

For those interested, a complete tabulation of the entire questionnaire will appear in one of the next issues of *YLRL Harmonics*.

Keeping Up With the Girls

From an OM — W2TUK, Asst. SCM of N. Y. C.-L. I. — a tribute to a YL: "As a participating amateur in the amateur radio exhibit at the Mineola Fair and Long Island Agricultural and Industrial Exhibition, L. I., during the middle of October, I would like to comment on the performance of one of the XYL hams. W2KER, Georgianna Mezey, operated station K2DHC/2 every day from opening time to closing time (1:00-11:00 p.m.) with time out for dinner. Her efforts in behalf of our hobby are to be commended." . . . YLRL Pres. W1BCU announces the appointment of G3GON, Ann Walford, as YLRL Chairman for England and the Continent. Ann's new QTH is 1, The Grange, Water St., Mere, Warmminster, Wiltshire, England; and ZEIJE, Molly Henderson (Box 460, Salisbury, So. Rhodesia), has accepted appointment as Chairman for Africa. . . . The new Publicity Chairman for the LARK of Chicago is W9BCA, Helen. . . . W2EEO, Madeline, has assembled the Heathkit AR-2 receiver . . . the first piece of gear she has tackled herself. . . . W7s HHH, Ben; NJS, Beth; and RVM, Helen, enjoyed hearing WIBDI of ARRL speak at a Fall meeting of the Portland Amateur Radio Club. . . . W7HHH has her YLCC with endorsement for the first fifty additional. . . . W6WRT, Ruby, writes that the following should be added to the list

*YL Editor, QST. Please send all contributions to W1QON's home address: 318 Fisher St., Walpole, Mass.

(Dec. column) of those YLs at the Southwestern Division Convention: W6s CSC CVE LNP MA QVK, K6CPX, KN6s ABJ and BHP. . . . From OM W1LIG the following three items: On Nov. third WNIZEF of Stratford, Conn., had her ninth child. (To our knowledge she thus wins the honor of being the YL with the greatest number of children. W1TUD, Alice, and W4WYY, Myrtle, are runners-up with seven each — Ed.) Eleanor's OM is WN1YQR; her 16-year-old daughter is WN1ZHK; her oldest son is WN1ZEE. More hams due. . . . W1WJA, Marge, of Newport, Vt., was thrilled to work W4RWR/1 aircraft mobile, at an altitude of 4500 feet on approach to Westover Field. . . . W1VJH, Therese, of Bridgeport, is active on two. . . . Thirteen-year-old W0IKJ, Carole, recently became General Class. . . . ZS6KK, Marie, of Johannesburg, is President of the South Africa Women's Radio Club and Editress of the Club's publication *YL Beam*. . . . W1YYM, Ellen, was happy about working rare EA9 (Rio de Oro) on both 20 and 80. . . . W1VBT, Cecile, is doing fine on 40 'phone with 40 watts and VE3DEA reports that in a short time she has met more YLs on 40 than she ever did on 75, thanks in part to W5HLF. When Denny's rig wouldn't tune high enough on 75 for the YL net, Arlie gathered the W girls and



W0ZW1 does her part to let the amateur world know that there are some YLs in South Dakota, even though they may number only a handful. The SCM of the Coyote state, W0RRN, is proud of the record of one of the YLs in his district, and we are indebted to him for Martha Shirley's picture and story.

Licensed in 1937, Martha plunged into radio enthusiastically from the start. During the war she taught code several hours a day on her own time and also served the War Department in various communications capacities. A charter member of the YLRL, she is now President of the XYL Club (Ladies' Auxiliary of the Black Hills Amateur Radio Club). She's on 80 and 75 very regularly, running about 100 watts with a rig composed entirely of surplus gear. Her operating position is in the kitchen — her OM, W0YQR, holds forth in the garage!

went to the low end of 40 to accommodate Denny. Now each A.M. at 1100 there's a lively roundtable on 7215 kc., to which all are invited. . . . Two new YLs in Glendale are KN6CMK, Alice, and W6DXI, Gladys. . . . The Long Island Unit of the YLRL voted to continue its work for the *Braille Technical Press*. . . . W1FTJ, Dot, and W1QON were pleased to entertain W5RZJ, Louisa, during her recent visit East. . . . Congratulations to the several "Headquarters girls" who have recently obtained their own amateur licenses. See photo and write-up in Nov. QST, page 45.

More suggestions for consideration in our running discussion of the terms "YL" and "XYL"!

(Continued on page 132)

September V.H.F. Party Results

Wide-Open Bands Set Off Record Scoring Spree

WELL, boys, they did it again! The Number One and Number Two spots in the national ranking for the September V.H.F. Party were captured by YLs. WSBFQ, West Richfield, Ohio, turned the trick, again, and W2FBZ, Upper Montclair, N. J., was close behind her. Margaret and Lee swept past their nearest competitors by more than 2000 points! The only consolation we males can take from this is the thought of two capable chief-engineer husbands, W8WJC and W2FBR, respectively, lurking in the background. This detracts in no way from the fine operating job turned in by these two topnotch v.h.f. YLs, whose untiring efforts have earned them the respect of v.h.f. men everywhere.

Time was when a v.h.f. contest could be won by operating only during normal human hours, but the competition is getting so stiff these days, and the interest so high, that contacts are made around the clock. WSBFQ got only about one hour of sleep this time!

And we used to think that if we got more than a hundred logs, a contest was a success. Now the file is running around 300 per party, with many more in the V.H.F. Sweepstakes. Contest operating is really taking hold, and every party seems to generate more enthusiasm.

As we reported previously, the weatherman was working for us in the September Party. We caught the best week end of the month, and as a result, scores broke all records. Tropospheric conditions were excellent everywhere east of the Mississippi, and some impressive DX contacts were racked up. W5RCI, Marks, Miss., worked up to Ohio, Michigan and Ontario, and W4HHK, W4UDQ, and W4WCB had the gang in these areas fighting for a chance at Tennessee. Good tropospheric propagation along the Atlantic Seaboard gave W1KID/1 in Maine, W1PZA/1, W1MHL/1 and W1UIZ/1 in New Hampshire, and W1SPX/1, W1CTW/1 and W2SFK/1 in Vermont a chance to provide contacts with these hard-to-get states as far south as Virginia. A short burst of aurora around midnight turned what was already bedlam into an almost indescribable scramble. You could take your choice — but you had to get them quickly to stay near the top of the heap!

Mountain-top portable expeditions were out everywhere, and photos reproduced here are typical. Though most were multiple-operator set-ups, and therefore ineligible for certificate awards, their work contributed greatly to everyone's enjoyment of the party. Veterans of many such forays, the v.h.f. section of the Waltham Amateur Radio Association topped their previous contest efforts when W1MHL/1, Pack Monadnock Mountain, Peterboro, N. H., worked

230 stations on 144 Mc., 55 on 50 Mc., 15 on 220 Mc., and 4 on 420 Mc.; 304 contacts with a section multiplier of 38, for 12,274 points. W1PZA/1, also in New Hampshire, on the summit of Mt. Kearsarge, near Warner, made 234 contacts on 4 bands for 8785 points. They were operating one rig at a time, whereas W1MHL/1 was using two simultaneously, which just about accounts for the difference.

The lofty spots in the Far West were well populated, and we have second-hand reports of many fine exploits in that department, but all too few of the participants took the trouble to report their work. Notable among those who did was W6MXQ/7, Ashland Peak, Oregon, whose operation made possible the first California-Oregon and Nevada-Oregon QSOs in 2-meter history. Close to the ultimate low in reporting is Southern California. With one of the greatest concentrations of v.h.f. activity in the nation, the Los Angeles Section came up with just one contest report. What say, 2-Meters and Down Club — how about organizing for mass participation (and reporting!) in the V.H.F. Sweepstakes?



Here's a team that made v.h.f. contest history. Operating from the ranger's cabin atop Pack Monadnock Mountain, Peterboro, N. H., W1MHL/1, Waltham Amateur Radio Association, worked 304 stations on 4 bands for 12,274 points. L. to r., W1RUD, Chief Engineer; Lippincott, Asst.; W1PYM, 2-meter opr.; W1QMN, 50-, 220- and 420-Mc. opr. (Photo, W1LUF)



Use of 220 and 420 continues to rise, despite the reduction in credit for these bands from 5 points per contact to 2. This time 30 contestants reported work on 420 and 25 used 220.

The boom in Midwestern 2-meter activity continues. W9KLR, Rensselaer, Ind., gave W9s a mark to shoot at in the future, working 148 stations in 12 sections on 144 Mc. W9ORZ, 8, just moved to Michigan, got his gear going the afternoon of the contest, yet was able to connect with 133 stations in 14 sections, using 144 Mc. only. W9NJS, 9 tried out something new in v.h.f. locations — the top floor of a grain elevator at Sheldon, Ill. With just a short length of coax he was able to get his 2-meter beam 200 feet above ground. Result: 123 contacts in 10 sections, with only 10 watts input.

Best 2-meter DX of the Party: W5RCI — VE3AIB, nearly 900 miles. Most sections ever worked on 144 Mc.: W1AO, Falls Church, Va., 19. (Also highest one-band total.) Record score for Novice-Technician — W3VIR, with 105 contacts in 20 sections, 2330 points. Top 50-Mc. score — W1DJ, with 50 contacts in 11 sections, 550 points.

In the following tabulation, scores are listed by ARRL divisions and sections. Unless otherwise noted, the top scorer in each section receives a certificate award. The highest Novice and Technician licensees in each section also receive certificates. Asterisks denote Technician winners. Columns indicate the final score, the number of contacts, the section multiplier, and the bands used. A represents 50 Mc., B 144 Mc., C 220 Mc., D 420 Mc. and E 1215 Mc. Multiple-operator stations, with calls of participating operators, are shown at the end of each section tabulation.

ATLANTIC DIVISION

E. Pennsylvania

W3UKI... 2698-142-19-AB
W3IBH... 2660-190-14-B
W3VIR/W3VIR*
2320-105-20-BCD
W3TYX... 1320-132-10-B
W3SAO... 954-106-9-B
W3TDF... 845-65-13-B
W3NP... 825-75-11-B
W3UMT... 720-72-10-B
W3OXQ... 420-35-12-B
W3NOK... 360-45-8-B

W3VMJ... 200-40-5-B
W3FTR... 148-37-4-B
W3TF... 133-19-7-B
W3VNR... 84-21-4-B
W3VNS... 64-32-2-B
W3SSU... 60-12-5-B
W3THB/3... 11-11-1-B
W3KX/3/W3LCK LCM LZD
MRQ OST PMG QDW QGX
3336-90-34-ABCD
Md.-Del.-D. C.
W3PYW... 1092-91-12-B
W3TOM/3... 957-83-11-BD

From this spectacular setting 3000 feet above sea level at Emerald Lake, Calif., W6OJB/6 made 35 contacts on 144 Mc., all more than 150 miles distant. These included W6MXQ/7 at Ashland Peak, Oregon, directly over snow-covered Mt. Lassen, seen in the background. (Photo by W6JDV)

W3JEW... 531-57-9-ABD
W3LMC... 418-56-8-B
W3GKP... 297-33-9-B
W3LZZ... 160-32-5-B
W3TFA... 81-19-4-BC
W3RQT... 44-10-4-AD
W3NH... 33-11-3-B
W3VHF... 8-4-2-B

S. New Jersey

W2QED... 4200-130-30-ABCD
W2UK... 1836-102-18-B
W2BLV... 1092-85-12-BD
W2EWN... 558-60-9-BD
W2ORA... 495-45-11-AB
W2AF/2... 155-35-13-A
W2ZQ... 290-58-5-B

Western New York

W2ORI... 1380-87-15-BD
W2RUI... 1176-79-14-ABCD
W2FCG/2... 638-58-11-B
W2OWF... 500-50-10-AB
K2CEH... 396-41-9-B
W2WFB... 560-45-8-B
W2RGJ/2... 280-35-8-B
W2UTH... 210-40-6-AB
W2VCI... 216-51-4-B
W2ALL... 208-52-4-B
W2ZHB... 140-35-4-B
KN2EGD... 135-45-3-B
W2UYS... 81-28-3-B
W2ZHI... 64-16-4-AB
W2QY... 15-15-1-B
W2RHQ/2... 13-13-1-B
K2ALZ*... 12-6-3-2-CD
K2CVX/2... 10-10-1-B
W2GWT... 9-9-1-B
W2FMX (W2VLY)
56-14-4-B

W. Pennsylvania

W3QKI... 1425-95-15-B
W3KJM... 41-11-4-A
W3TZW... 2-2-1-B

CENTRAL DIVISION

Illinois

W9NJS/9... 1230-123-10-B
W9WOK... 954-106-9-AB
W9QKM... 525-75-7-AB
W9KPS... 441-49-9-B
W9YOF... 330-66-5-B
W9ZEX... 321-81-4-B
W9WNK... 240-60-4-B
W9VNW... 196-49-4-B
W9QTV... 184-46-4-B
W9USI... 184-46-4-B
W9FPO... 164-41-4-B
W9KCW... 140-35-4-B
W9ADO... 130-26-5-B
W9N9N/9... 124-31-4-B
W9KAB... 116-29-4-B
W9SST... 105-35-3-B

W9SEF... 81-42-2-B
W9ILR/9... 69-23-3-B
W9JYG... 66-22-3-B
W9OOX... 26-26-1-B
W9PEN/9... 25-25-1-B

Indiana

W9KLR... 1776-148-12-B
W9ZHL... 598-46-13-AB
W9OYB/9... 210-35-6-B
W9BUM... 90-30-3-B
W9MFH... 11-7-2-A
W9YIL... 1-1-1-A

Wisconsin

W9ZAD... 290-58-5-B
W9BTI... 228-38-6-AB
W9TQ... 205-41-5-AB
W9DDG... 125-25-5-B

DAKOTA DIVISION

Minnesota

W9OYF... 5-5-1-B

DELTA DIVISION

Mississippi

W5RCI... 230-22-10-BC

Tennessee

W4WCB... 387-42-9-BC
W4HHK... 216-27-8-B
W4UDQ... 176-22-8-B
W4TIZ... 12-6-2-B
W4TIE... 10-5-2-B

GREAT LAKES DIVISION

Kentucky

W4PCT... 924-84-11-AB

Michigan

W8RMH... 2278-130-17-ABC
W9ORZ/8... 1862-133-14-B
W8DX... 1400-91-15-BCD
W8CMI... 876-68-12-BC
W8IEE... 760-76-10-B
W8GNN... 748-68-11-B
W8RWW... 648-72-9-B
W8GZN... 610-61-10-B
W8NOH... 330-55-6-AB
W8ZND... 288-48-6-B
W8DDO... 150-30-5-B
W8AIB... 40-20-2-B
W8IPR*... 12-3-2-C
W8NONS (W8NO ONO ONR
ONS)... 22-11-2-B

Ohio

W8BFQ... 6727-202-31-ABCD
W8LPD... 1265-115-11-AB
W8SVI... 1035-115-9-B

W8HOH 664-83-8-AB
W8SRW 660-00-11-B
W8LTT 576-72-8-B
W8HCD 568-71-8-AB
W8LOF 544-68-8-B
W8SDJ 402-67-6-B
W8BMO 399-57-7-AB
W8HQK 343-49-7-AB
W8DRN 336-42-8-AB
W8LUZ 330-55-6-B
W8BAX 231-33-7-B
W8N8PY 222-37-6-B
W8HSY 205-41-5-B
W8JSW 205-41-5-B
W8N8EE 188-47-4-B
W8N8QI 180-30-6-B
W8N8MLK 140-35-4-B
W8UEY 114-18-6-BC
W8MVA 64-32-2-B
W8PAZ 56-14-4-B
W8DPW 44-22-2-B
W8PMJ 42-14-3-B
W8HUA 30-15-2-B
W8WRN 16-8-2-B
W8YOA/8 (W8s LVQ YOA)
343-49-7-B

HUDSON DIVISION

Eastern New York

W2BVU 1220-61-20-AB
W2PV 440-44-10-B
W2IP 115-23-5-B
W2MXJ 16-4-4-B

N.Y.C.-L.I.

W2DLO 2023-119-17-B
W2DHB 1656-138-12-B
W2GIMT 1300-100-13-B
K2DU1 672-56-12-B
K2CHM 497-71-7-B
W2DZR 450-50-9-B
W2OQI/2 410-41-10-AB
W2IBQ 384-64-6-B
W2BNX/2 360-60-6-B
K2BHV 300-50-6-B
W2LID/M 288-36-8-B
W2AOD 280-33-8-B
W2KIR 259-37-7-B
K2EBW 210-42-5-B
W2FBL 210-42-5-B
K2CJP 198-33-6-B
W2GDI 192-48-4-B
W2FEI 132-33-4-B
W2ENW 128-32-4-B
K2EWB 114-38-3-B
W2KTF/M 75-25-3-B
W2JBQ 64-16-4-B
W2IN 48-12-4-B
W2MZY 20-20-1-B
W2GGP 7-7-1-B
W2TUK 2-2-1-B
K2CQY 1-1-1-B
W2BVI (K2CQY KN2DEB)
250-50-5-B

N. New Jersey

W2FBZ 6324-175-34
W2RGV 4752-198-24-AB

K2EBL 682-62-11-B
W2DZA 108-9-6-CD
KN2DQA/M 20-5-4-B

MIDWEST DIVISION

Missouri

W0HID 420-42-10-AB

NEW ENGLAND DIVISION

Connecticut

W1HDQ? 7410-165-39
W1WKW 1862-133-14-B
W1PHR 1212-101-12-B
W1HDF 1072-58-16-
W1RGM/I 1008-63-16-AB
W1URC 660-55-13-B
W1VLA 392-56-7-B
W1DDP 342-57-6-B
W1NYDM/W1YDM/I*
312-38-8-BD
W1AW? 224-32-7-AB
W1KHM 150-30-5-AB
W1VXJ 135-27-5-B
W1RMU 100-25-4-B
W1TXI 60-20-3-B
W1VGP 38-19-2-B
W1LIL/M 32-16-2-B
W1OLG 27-9-3-B
W1USF 4-2-1-D
W1DBM (W1s KHL ODW)
2720-170-16-B
W1VLK/I (W1s VLI VLK)
991-50-17-ABD

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W1DRF 1080-90-12-AB
W1JWV 100-25-4-B
W1ESA 80-20-4-B
W1LFF 48-12-4-A
W1IZCR/W1ZCR/I
48-12-3-BC
W1TTL* 8-2-2-C

New Hampshire

W1UIZ/I 1616-96-16-BC
W1RMH 210-30-7-AB
W1MHL/I (W1s PYM QMN)
12,274-304-38-ABCD
W1PZA/I (W1s JDF KNU
OOP PZA)
8785-234-35-ABCD

Rhode Island

W1KCS 1722-81-21-ABD
W1SGA 1122-66-17-AB
W1PXL 392-49-8-B
W1VEM 120-30-4-B
W1UEF/I 108-27-4-B

Vermont

W1CTW/I 2140-102-20-AB
W2SFK/I 1302-93-14-B
W1MMN 96-12-8-B
W1MEP 90-15-6-B

NORTHWESTERN DIVISION

Oregon

W7NGW 27-9-3-AB
W7OKV/7 (W7OKV W0NSX)
132-33-4-AB
W6MXQ/7 (W6s APC MXQ
WGM) 128-16-8-B

Washington

W7IEE 180-36-5-AB
W7JHX 129-43-3-B
W7MZS 129-43-3-B
W7PXB 126-42-3-B
W7UFE 111-37-3-B
W7RXS 80-40-2-B
W7JWE/M 48-24-2-B
W7KO 48-24-2-AB
W7QKE 48-16-3-B
W7PAE 46-23-2-B
W7UGV 20-20-1-B
W7QGF 11-11-1-B
W7RR (W7s PZO QKE)
25-25-1-B

PACIFIC DIVISION

Nevada

W6RLB/7 108-18-6-B

Santa Clara Valley

W6ZBS 189-27-7-AB
W6ZTJ 44-11-4-B
W6LMN 39-13-3-B
W6SSA/6 (W6s BDO SSA YGX
ZEA) 1342-118-11-ABD

East Bay

W6OHQ/6 744-93-8-B
KN6AO 150-30-5-B
W6ITR 2-2-1-B
K6AZH/6 (W6s AWU GDM
HOR ITE JKI JLG KPZ RKT
VDR ZHY ZYT)
1170-114-10-BD

San Francisco

W6AJF 1428-97-14-ABD
W6BAZ 432-54-8-B
KN6BAS 100-20-5-B

Sacramento Valley

W6PIV/6 504-56-9-AB
W6JAC 216-36-6-B
W6PIV 68-17-4-B
KN6AXN/6 8-4-2-B

San Joaquin Valley

W6BHR/6 (W6s ALW BHR)
792-72-11-AB

ROANOKE DIVISION

Virginia

W4AO 2869-151-19-B
W4URY 1164-97-12-B
W4BCT 399-57-7-B
W4LJ 399-57-7-B

West Virginia

W4EP 72-12-6-AB
W4PZK/8 (W4s VBP)
180-36-5-B

SOUTHEASTERN DIVISION

Georgia

W4LNG 12-1-3-AB

(Continued on page 110)

Another high-scoring mountain-top layout was W1PZA/I, Mt. Kearsarge, near Warner, N. H. W1PZA/I and W1JDF inspect the rigging on the antennas for 420, 50 and 144 and 220 Mc. Look closer, and spot a third member of the team, W1OOP or W1KNI, "sacking" at the base of the 420-Mc. support.

January 1954



7th V.H.F. Sweepstakes, Jan. 9th-10th

ARRL Certificates to Leaders — Gavel for Winning Club

How many states do you have toward your 50- or 144-Mc. WAS? What's your best DX on 220 and 420? ARRL cordially invites amateurs who can work on 50 Mc. or higher to bolster these totals and meet new v.h.f. friends by taking part in the Seventh Annual V.H.F. Sweepstakes. The contest period starts at 2:00 P.M. your local time, Saturday, January 9th, and continues to midnight, Sunday, January 10th.

The rules for participation are simple. Just call "CQ Sweepstakes" on 'phone or "CQ SS" on c.w. to get in touch with other contestants, then exchange SS information as shown elsewhere in this announcement. This information is in the form of a message preamble, with the ARRL section (see page 6 of this *QST*) substituted for the city and state, and the RST report for "check."

Try to work as many v.h.f. stations as you can. When an exchange of SS data is completed in both directions, two points may be claimed. To figure your score, multiply total contact points by the number of different ARRL sections worked. You may use 'phone, m.c.w., or c.w., with results contributing toward one score.

Certificate awards will go to V.H.F. Sweepstakes winners in each ARRL section. In addition, a certificate will be given to the top Novice or Technician in each ARRL section where at least three such licensees submit valid contest logs, and to leading operators of clubs where three

or more entries are received. A handsome gavel with sterling-silver band, engraved with the name of the winner, will go to the club with the top aggregate score.

Contest reporting forms for your convenience will be sent free on request. If you don't use these forms, please follow the log arrangement shown. All lists, large or small, are welcomed by ARRL to help support the claims of others and to make complete results in *QST* possible. Report as soon as the contest is over.

Last year's V.H.F. SS brought 385 reports, an all-time high for a v.h.f. activity. Looks like this one might be even bigger, so why not get the gear in readiness — then stand by for a week end of real fun in the world above 50 Mc.!

Rules

1) *Eligibility:* Amateur operators in any ARRL section (see page 6) operating at home, or mobile or portable under one call on or above 50 Mc. are invited to take part.

2) *Object:* Participants will attempt to contact as many other stations in as many ARRL sections as possible.

3) *Contest Period:* The contest starts at 2:00 P.M. your local time, Saturday, Jan. 9, 1954, and ends at midnight, Sunday, Jan. 10, 1954.

4) *Exchanges:* Contest exchanges, including all data shown in the sample, must be transmitted and receipted for as a basis for each scored point.

5) *Scoring:* (a) Contacts count one point when the required exchange information has been received and acknowledged, a second point when exchange has been completed in both directions.

(b) Final score is obtained by multiplying total contact points by the number of different ARRL sections worked

STATION W. . . . SUMMARY OF V.H.F. SWEEPSTAKES EXCHANGES

Freq. Band (Mc.)	SENT (1 point)				Time ST	Date (Jan.)	RECEIVED (1 point)				Time	Date (Jan.)	Number of Each Different New Section as Worked	Points
	NR	Stn.	CK- RST	Section			NR	Stn.	CK- RST	Section				
50	1	W1AW	57	Conn.	4:15 P.M.	9	3	W1PHR	47	Conn.	4:18 P.M.	9	1	2
50	2		43		4:35 P.M.	9	7	W1HDQ	59	Conn.	4:40 P.M.	9	..	2
50	3		58		9:09 P.M.	9	6	W1JDS/1	359	Maine	9:11 P.M.	9	2	2
144	4		49		9:30 P.M.	9	32	W1AHH	58	E. Mass.	9:36 P.M.	9	2	2
144	5		57		9:50 P.M.	9	15	W1VLH	58	Conn.	9:46 P.M.	9	..	2
50	6		54		11:30 P.M.	9	11	W2AOC	48	N. Y. C. - L. I.	11:32 P.M.	9	4	2
420	7		58		11:35 P.M.	9	30	W1PHR	57	Conn.	11:35 P.M.	9	..	2
144	8		57		11:45 P.M.	9	21	W3LMC	59	Md.-Del.-D.C.	11:56 P.M.	9	5	2
144	..		..				18	W9QXP	59	Ill.	12:34 A.M.	10	6	1
144	9	W1AW	34	Conn.	8:50 A.M.	10	27	W1NY	59	W. Mass.	8:47 A.M.	10	7	2
50	10		479		9:18 P.M.	10	12	W6NHB	379x	S. Tex.	8:20 P.M.	10	8	2
50	11		589		10:40 P.M.	10	20	VE1QY	569	Maritime	11:35 P.M.	10	9	2

No. Bands Used: 3

9 Sec., 23 Pts.

Number and names of operators having a share in above work

Claimed score: 23 points X 9 sections = 207.

I hereby state that score and points set forth in the above summary are correct and true.

Equipment:

Signature:

Address:

Tube line-up:

Number different stations worked:

EXPLANATION OF V.H.F. SS CONTEST EXCHANGES

Send Like Standard Msg. Preamble		Call	CK	Place	Time	Date
Exchanges	Contest numbers 1, 2, 3, etc., a new NR for each station worked	Send your own call	CK (Readability and strength or RST of station worked)	Your ARRL section	Send time of transmitting this NR	Send date of QSO
Purpose (example)	QSO NR tells how you are doing (NR1)	Identification (W1AW)	RS or RST report (589)	Vital contest data (Conn.)	Time and date must fall in contest period (6:55 P.M. Jan. 10)	

(the number in each of which at least one SS point has been credited).

6) *Conditions for Valid Contact Credit:* (a) Repeat contacts on other bands confirmed by completed exchanges of up to two points per band may be counted for each different station worked. (Example: W1HDQ works W8BEQ on 50 and 144 Mc. for complete exchanges of 2 points on each band; 2 + 2 gives 4 points but only one section multiplier.)

(b) Cross-band work shall not count.

(c) Portable or mobile station operation under one call, from one location only, is permitted.

7) *Awards:* Entries will be classified as single- or multi-operator, a single-operator station being defined as one manned by an amateur who neither receives nor gives assistance to any person during the contest period. Certificates will be awarded in each ARRL section to the top-scoring amateur in the single-operator classification. In addition, a certificate will be awarded to the top Novice or Technician in each ARRL section where at least three such licenses submit valid contest logs. Multioperator work will be

grouped separately in the official report of results in QST.

When three or more individual club members compete and submit logs naming the club with which they are identified, an ARRL certificate will be issued to the leading club member. When less than three individual logs are received there will be no club award or club mention.

A gavel with an engraved sterling-silver band will be offered the club whose secretary submits the greatest aggregate score, provided such scores are confirmed by receipt at ARRL of the individual contest logs from such members (resident club members only). Claims from federations, radio club councils, or other combinations of radio clubs, will not be accepted. Special memberships granted for contest purposes will not be recognized.

8) *Conditions of Entry:* Each entrant agrees to be bound by the provisions of this announcement, the regulations of his licensing authority, and the decisions of the ARRL Award Committee.

9) *Reporting:* Reports must be postmarked no later than January 25, 1954, to be considered for awards.

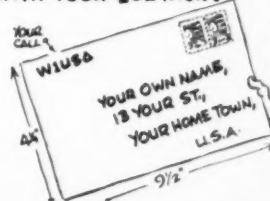
A.R.R.L. QSL BUREAU

The function of the ARRL QSL Bureau system is to facilitate delivery to amateurs in the United States, its possessions, and Canada of those QSL cards which arrive from amateur stations in other parts of the world. Its operation is made possible by volunteer managers in each W, K and VE call area. All you have to do is send your QSL manager (see list below) a stamped self-addressed envelope about 4 1/4 by 9 1/2 inches in size, with your name and address in the usual place on the front of the envelope and your call printed in capital letters in the upper left-hand corner. (Bold-face type indicates change since last QST listing.)

W1, K1 — J. R. Baker, Jr., W1JOJ, Box 232, Ipswich, Mass.
W2, K2 — H. W. Yahnel, W2SN, Lake Ave., Helmetta, N. J.
W3, K3 — Jesse Bieberman, W3KT, Box 34, Philadelphia 5, Penna.
W4, K4 — Thomas M. Moss, W4HYW, Box 644, Municipal Airport Branch, Atlanta, Ga.
W5, K5 — Oren B. Gambill, W5WI, 2514 N. Garrison, Tulsa 6, Okla.
W6, K6 — Horace R. Greer, W6TI, 414 Fairmount St., Oakland, Calif.
W7, K7 — Mary Ann Tatro, W7FWR, 513 N. Central, Olympia, Wash.
W8, K8 — Walter E. Musgrave, W8NGW, 1294 E. 188th St., Cleveland 10, Ohio.
W9, K9 — John F. Schneider, W9CFT, 311 W. Ross Ave., Wauwat, Wis.
W0, K0 — Alva A. Smith, W0DMA, 238 East Main St., Caledonia, Minn.

VE1 — L. J. Fader, VE1FQ, 125 Henry St., Halifax, N. S.
VE2 — Austin A. W. Smith, VE2UW, 6164 Jeanne Mance, Montreal 8, Que.
VE3 — W. Bert Knowles, VE3QB, Lanark, Ont.
VE4 — Len Cuff, VE4LC, 286 Rutland St., St. James, Man.
VE5 — Fred Ward, VE5OP, 899 Connaught Ave., Moose Jaw, Sask.
VE6 — W. R. Savage, VE6EO, 329 15th St., North Lethbridge, Alta.
VE7 — H. R. Hough, VE7HR, 2316 Trent St., Victoria, B. C.
VE8 — W. L. Geary, VE8AW, Box 534, Whitehorse, Y. T.
VO — Ernest Ash, VO1A, P.O. Box 8, St. John's, Newfoundland.
KP4 — E. W. Mayer, KP4KD, Box 1061, San Juan, P. R.
KH6 — Andy H. Fuchikami, KH6BA, 2543 Namau Dr., Honolulu, T. H.
K17 — Box 73, Douglas, Alaska.
KZ5 — Gilbert C. Foster, KZ5GF, Box 407, Balboa, Canal Zone.

**IS YOURS ON FILE
WITH YOUR QSL MGR?**



The World Above 50 Mc.

CONDUCTED BY E. P. TILTON,* WHDQ

"It's a swell contest — but why in January?"

We can count on there being a dozen or so comments like this in the logs that will come in after the 7th Annual V.H.F. Sweepstakes, January 9th and 10th. Not a few of the brethren seem to feel that since this is the biggest of the v.h.f. operating activities, it should be scheduled during the season when activity is normally highest.

This viewpoint overlooks the principal reason for having v.h.f. contests at all: the promotion of activity and interest. Try to picture, if you will, what the world above 50 Mc. would be like if we had no contest incentive in midwinter. V.h.f. operation is seasonal enough as it is. With the counterattractions of lower frequencies reaching their peak in the colder months, and v.h.f. DX dropping off coincidentally, those of us who like to stay with the v.h.f. bands the year around would be having a rather quiet time of it by January if that v.h.f. SS was not coming up.

The v.h.f. version of the SS is one of the most popular ARRL-sponsored operating contests. It goes without saying that it is certain to thaw out a lot of gear for 50 Mc. and higher that might otherwise be in mothballs until May or June.

Wherever there is v.h.f. interest, club groups are right now organizing for a shot at that gavel that is awarded each year for the highest aggregate score. Every piece of v.h.f. gear in the area will be seeing service. There'll be some calls that you'll not hear again until the next contest, but we can't help but feel that these week ends of concentrated v.h.f. activity make a few steady converts, too. Certainly there is no better time to find out what the bands above 50 Mc. are good for, and each year quite a few fellows are surprised to find that they are good for plenty of fun, even in the midst of the supposedly dead season.

Here and There on the V.H.F. Bands

Tests over the 950-mile path between W4HHK, Collierville, Tenn., and the Northern New Jersey W2s are still under way on 144 Mc. Too late for reporting last month, an exchange of information was completed by W4HHK and W2UK on the morning of Oct. 22nd in sufficient detail to qualify it as a QSO. Aided by favorable tropospheric conditions, apparently, the signal of W4HHK was strong enough to be recorded solidly for a stretch of two minutes or more at W2UK, and Tommy's reply and report were copied at the southern end.

Just how far this path is below a communication signal is hard to say, as the depth of the fades is unknown at present. So far, they slice off only the tops of highest signal peaks. Another 10 db., which is the probable limit within the framework of the amateur regulations, might get down deep enough into the space between these peaks so that a fair amount of intelligence could be exchanged. It has been estimated by Villard that to go from the present estimated 5 per cent signal to one that would be in there 95 per cent of

the time might require as much as 45 db. increase. The shape of the signal curve would have to be known much better than at present to allow more than a guess as to the requirements for solid or near-solid communication over such a path. More information may be available when W4HHK completes his corton-field rhombic and kilowatt c.w. rig, both in the works as we write.

The fall inversion season continued into November, and propagation over much of the country seemed to be holding up well in comparison with what October offered. What is believed to be the first Missouri-New York 2-meter contact of 1953 was made at 0019 EST Nov. 2nd, between W20RI, Lockport, N. Y., and W0HD, Overland, Mo. W0KYF, University City, Mo., was worked immediately after.

During the W8BFQ-W1HDQ schedule at 0745 the same



W0ZJB	48	W5VY	48	W8OJN	39
W0BJV	48	W5MJD	47	W8LPD	37
W0CJS	48	W5GNQ	46		
W5AJG	48	W5ONS	45	W9ZHB	48
W9ZHL	48	W5JTI	44	W9QUV	48
W9OCA	48	W5ML	44	W9HGE	47
W6OB	48	W5JLY	43	W9PK	47
W0INI	48	W5JME	43	W9VZP	47
W1HDQ	48	W5FW	43	W9RQM	47
		W5VY	42	W9ALU	47
W1CLS	46	W5FAL	41	W9QKM	46
W1CGY	46	W5ESC	41	W9CIA	45
W1LL	46	W5HLD	40	W9UNS	45
W1LSN	44	W5HEZ	38		
W1HMS	43	W5LIU	37	W0QIN	47
W1DJ	41	W5FXN	37	W0DZM	47
				W0NFM	47
W2AMJ	46	W6WNN	48	W0TKX	47
W2MEU	46	W6ANN	45	W0KYF	47
W2RLV	45	W6TMI	45	W0HVV	45
W2IDZ	45	W6IWS	41	W0MVG	44
W2FBJ	44	W6OVK	40	W0JOL	44
W2GVV	40	W6CGG	35	W0TJF	44
W2QVH	38	W6BWG	29	W0WKB	43
W2ZIW	35			W0JHS	43
		W7HEA	47	W0PKD	43
W3OJF	46	W7ERA	47	W0PII	41
W3NKM	41	W7BQX	47		
W3MQU	39	W7FDJ	46	VE3ANY	42
W3RUE	37	W7DYD	45	VE3AET	41
W3OTC	37	W7JRG	44	VE1QZ	34
W3FPH	35	W7BOC	42	VE1QY	31
		W7JPA	42	XE1GE	25
W4RHH	46	W7FVY	41	C06WW	21
W4EQM	44	W7CAM	40		
W4QN	44	W7ACD	40		
W4FHH	42				
W4CPZ	42	W8N8S	46		
W4FLW	42	W8NQD	45		
W4OXC	41	W8UZ	45		
W4MS	40	W8FMS	45		
W4ENR	39	W8YLS	41		
W4UJ	38	W8RFW	41		
W4REN	35	W8BFQ	42		

Calls in bold-face are holders of special 50-Mc. WAS certificates listed in order of award numbers. Others are based on inverted reports.

* V.H.F. Editor, QST

morning, Margaret had the thrill of experiencing strong interference on your conductor's frequency from W0IHD. Missouri breaking in on Connecticut doesn't happen every day on 144 Mc! Releasing of this information by W8BFQ set off a series of tries for Missouri by W2UK and the writer, but nothing came of it. Signals from W8BFQ were the best encountered since the schedules were begun late in July. Who says no DX after September? Incidentally, W8BFQ has been heard almost every day over this 450-mile haul, and little if any deterioration has been observed with the approach of colder weather. The same applies on our nightly workouts with W2ORL 325 miles. Both paths seem almost independent of weather, except on the quite rare occasions when there is a very widespread tropospheric opening.

Amateur TV is taking hold more all the time, and in widely distributed places. W4MS, Pensacola, Fla., writes that the American Amateur Television Society now boasts 63 members, in all parts of the country, and descriptions of equipment came in this month's mail from places as far apart as Ft. Wayne, Ind., and Finland.

W9UKI, Ft. Wayne, is on the air with test pattern, slides and live pick-up, providing good signals for W9UOI, who uses a converter ahead of a standard TV set. The camera equipment is similar to that described in November QST, and in addition, W9UKI has a 30-tube sync and blanking generator locking in the scan frequencies with the 60-cycle power line frequency. The transmitter r.f. section is an 832A tripler at present, but a higher-powered rig with 9903s is under construction.

From Finland, OH2NL writes that through the help of G3CVO of British Amateur Television Club fame and W9ECA, he has completed similar gear, except for the r.f. portion. Closed-circuit tests have been made with good results, so only the easy part remains to be done.

432 and 144 Mc. with One Tank Circuit

Want to try operation on 432 Mc. without building a separate rig for that band? W5HPC, Bellaire, Texas, shows how it can be done in the accompanying sketch. What's more, he does it with a 3E29 tube, which should be good news to fellows who are deterred from going on 432 Mc. by the high cost of tubes that are designed for v.h.f. service.

The basic idea is so simple that you wonder why you never tried it. A single plate circuit is made to serve for both bands, as a quarter-wave line on 144 and a three-quarter wave line on 432. The three-quarter wave method on 432 has an advantage over the half-wave tank circuits we've used previously, in that the r.f. voltage minimum is at the end of the line. With the half-wave line the plate voltage must be fed in at a point along the line where the r.f. voltage is at a minimum. This is OK for low-C tubes like the 832A and 9903/5894A, but with an 829B or 3E29 the voltage node is actually inside the tube.

W5HPC adds a 30,000-ohm resistor in series with his regular 5000-ohm grid leak for tripling, and the grid drive should be increased when this is done. He drops his screen

voltage until the plate input is not much over the rated plate dissipation for the 3E29, or about 45 watts. The plate circuit works on either band by the simple expedient of adding or removing the shorting bar on the plate line. Output on 432 Mc. is 6 to 8 watts with a 3E29 but only about half that much was developed with 829s and 829Bs tried.

Considerably better efficiency is possible if the tube and line are shielded, as radiation losses are quite high with an open layout. W5HPC uses a 3 x 3-inch shield over both line and tube. The output coupling loop is mounted above the shorted end of the line. Dimensions given are for the 3E29, but the idea should work nicely with the 832A, 9903 and other tubes normally used in 432-Mc. work, with a suitable lengthening of the line. There would be nothing to prevent the adaptation of the idea to the grid circuit, too, and we can visualize this making possible a single amplifier that will work effectively on 144, 220 and 420 Mc., with only the adjustment of the shorting bars (and the modification of the grid and screen voltages) involved in changing bands.

It should be remembered that a tripler is bound to radiate a considerable amount of energy on the driving frequency, unless extensive precautions are taken to eliminate all but the desired third-harmonic output. The driving frequency should be kept within the 144-Mc. band, in order to prevent possible interference to other v.h.f. services.

Horizontal Polarization and 2-Meter Mobile

With both horizontal polarization and 2-meter mobile becoming more popular, there is increasing interest in ways to combine the two. W2HNH, Syracuse, N. Y., reports good results in working horizontally-polarized stations with a 2-meter adaptation of the 6-meter halo described some years ago in QST by W1MUX.¹

Jack refuses to send pictures, because, he says, "My halo isn't exactly a thing of machine-like precision or beauty, but it does beat a vertical whip in the cheeks I've made with it." Briefly, it is a folded dipole made of hard-drawn No. 12 or 14 wire, bent around into a circle. The dipole is about 36½ inches long, which makes a circle 11¼ inches in diameter, when the ends of the dipole are separated by about 1¼ inches. Copper tabs are soldered to the dipole ends to make a tuning capacitor, and these plates are held apart by a ceramic spacer. The dipole is fed with RG-58 U.

Tuning is done by trimming the copper end plates until the antenna dips at the desired frequency on a grid-dip meter. The plates came out about ½ inch in diameter on the W2HNH halo. The wires of the dipole are held in alignment with respect to each other by pressing them into ¼-inch polystyrene rods, heating the wires with a soldering iron until the rod softens. Three spacers are used on each half of the dipole.

Experience in cross-polarization work with 2-meter mobiles in the irregular terrain of Western New England

¹ "A 'Halo' for 6 Meters," Stites, Oct., 1947, QST, p. 24. Also, ARRL Antenna Book, p. 213.

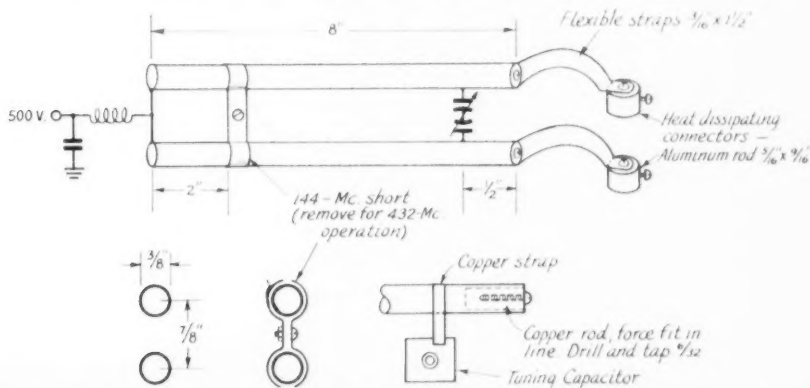


Fig. 1—Two-band tank circuit used by W5HPC for operation on 432 and 144 Mc. with a 3E29 tube. The removable shorting bar converts the line from $\frac{3}{4}$ -wave operation at 432 Mc. to $\frac{1}{4}$ -wave at 144

indicates that the loss from the dissimilar polarizations often is not great. Where the vertical mobile and the horizontal fixed station are separated by a ridge that blocks the line of sight, the mixture of horizontal and vertical may even be better than vertical-to-vertical. In a check with WITQF/1 (6 watts, 3/4-wave whip) en route to Boston from your conductor's home recently, comparisons of cross and matched polarization were made at frequent intervals. In the strong-signal area out to 7 or 8 miles there was no trouble, of course, with either polarization. As the mobile went over the top of the first range of hills and down into the Connecticut Valley, the horizontal array at W1HDQ averaged 10 db. better than the vertical colinear. The margin in favor of horizontal held all through the city of Hartford, at distances of 12 to 15 miles. On the east side of the river, and out to about 25 miles, it was a toss-up, with horizontal having the edge, when there was any noticeable difference. Then, as WITQF/1 started up the slope of the eastern side of the valley, vertical began to show a slight advantage. This was particularly noticeable when the take-off from the mobile was clear in our direction.

Contact was maintained out to a distance of about 40 miles, during which time our vertical was never more than about 3 db. better than the horizontal, and occasionally the margin would swing the other way, as the mobile went over the far side of a ridge or near power lines. Even at the extreme limit of audible signal there was not enough difference to make or break the continuity of the QSO. In flat open terrain, however, there may be quite a margin in favor of matched polarization.

Anyone for 1215?

Now that the more advanced 432-Mc. operators are pushing the limit of operating range, interest is turning to the next higher band, 1215 to 1300 Mc. The band has much to attract the experienced worker. Like 420, it is borderline territory, on the verge of but not quite wholly in the range where cavities, wave-guides and parabolas replace coils, transmission lines and parasitic elements.

When we began working on 420, few of us considered the possibility of using crystal control, and all the early work was done with modulated oscillators and broadband receivers. We had a lot of fun in the process, but we were far from exploiting the full worth of the band until we went to crystal control and high selectivity. Will it be the same story on 1215 Mc.? It's been almost eight years since the first communication was done by amateurs on frequencies higher than 1000 Mc., but at present we're still only a little beyond line of sight in our best DX work. Will conversion to stable transmission and high-selectivity reception on 1215 put us in business over nonvisual paths of several hundred miles?

Quite a few enterprising hams think so and are getting ready to try, so now comes the problem of what part of the band will be devoted to high-stability techniques. The last four megacycles at the high end looks like the best bet, as this will allow tripling twice from 144, without getting outside a ham band in the process. There are several tubes that might do the trick, with the 2C39 as one of the best prospects. Perhaps we might even work out a two-band amplifier-tripler, using a coaxial line version of the W5HPC system described herewith. For receiving there are several tubes that should give some gain and reasonable noise figures at 1200 Mc. The old stand-by, the 2C40 lighthouse, is certainly one of them, and the pencil tubes made for 1700-Mc. radiophone equipment should be usable. Many of these are in circulation, as the radiophone gear employing them is used only once. If you find one, it's yours.

In the antenna department we have the fascinating possibility of employing parabolic reflectors, with their high gain and nearly ideal directivity patterns. A dish big enough for some real gain is well within practical amateur structural limitations.

Propagation? Look at the signals we've been getting over distances of several hundred miles on 420 Mc. They frequently exceed the best that 144 can do over similar paths, so it seems reasonable to assume that the next higher band will do even better. Trapping will be more prevalent, and with it all sorts of intriguing prospects allied with weather variations.

Let's get started, gang — who will work the first home-station DX on 1215 Mc.? Getting ready will make a nice project for those long winter evenings.

2-METER STANDINGS

Call	States	Area	Miles	Call	States	Area	Miles
W1HDQ	18	6	850	W5FSC	6	2	500
W1IYZ	16	6	750	W3DFU	5	2	275
W1RFU	15	7	1150				
W1MNF	14	5	600	W6ZL	3	3	1400
W1BCN	14	5	580	W6JJA	3	3	1390
W1DJK	13	5	520	W6WSQ	3	3	1390
W1CTW	12	4	500	W6BAZ	3	2	320
W1KLC	12	4	500	KC6AAV/6	2	2	275
W1YQI	12	4	420	W6N1Z	2	2	237
W1OPI	12	4	420	W6GCG	2	2	193
W1MMN	10	5	320	W6EXH	2	2	193
				W6ZEM/6	1	1	415
W2UK	23	7	1075				
W2NLY	22	7	1050	W7LEE	3	2	240
W2ORI	21	8	1000	W7YZU	3	2	240
W2AZL	20	7	1050	W7JW	2	2	140
W2QED	19	7	1020	W7JUU	2	2	140
W2PAU	16	6	740	W7RAP	2	1	165
W2AMJ	14	5	550				
W2QNZ	14	5	400	W8BFQ	24	8	775
W2UTH	13	7	880	W8WJC	24	7	775
W2SPK	13	6	—	W8WRN	20	8	670
W2AOC	13	5	400	W8WXY	19	8	1200
W2DFV	13	5	350	W8DX	19	7	675
W2CET	13	5	405	W8BAX	19	7	655
W2DPB	12	5	500	W8UKS	18	7	720
W2FJH	12	5	—	W8RWW	17	7	630
				W8EP	17	7	—
W3RUE	20	7	760	W8RMH	16	7	690
W3QKI	20	7	820	W8WSE	16	7	830
W3NKM	19	7	660				
W3KWL	16	7	720	W9EHX	23	7	725
W3LNA	16	7	720	W9FVJ	22	8	850
W3FPH	16	7	—	W9EQC	21	8	820
W3GKP	15	6	800	W9BPV	20	7	1000
W3IBH	13	5	570	W9UCH	20	7	750
				W9LF	19	—	—
W4HHK	23	7	850	W9WOK	17	6	600
W4AO	20	7	950	W9ZHL	17	6	—
W4JFV	18	7	830	W9MBI	16	7	660
W4MKJ	16	7	665	W9KIR	16	7	—
W4OXC	14	7	500	W9BOV	15	6	—
W4JHC	14	5	720	W9LEE	14	6	780
W4IKZ	13	5	720	W9DDG	14	6	700
W4JFU	13	5	720	W9FAN	13	—	680
W4CLY	12	5	720	W9GTA	12	7	540
W4OLK	12	5	720	W9GTA	11	5	540
W4FJ	12	5	700	W9JBF	10	5	700
W4UMF	13	5	600	W9DSP	10	4	760
W4WCB	9	4	650				
W4UDQ	8	4	850	W9EMS	24	8	1175
W4TLA	7	4	850	W9GDU	22	7	1065
				W9HHD	19	7	725
W5RCL	20	7	925	W9ONQ	17	6	1090
W5JTH	14	5	670	W9N1	14	6	830
W5QNL	10	5	1400	W9ZJB	12	7	1097
W5CVW	10	5	1180	W9OAC	12	5	725
W5AJG	10	4	1260	W9WGX	11	5	760
W5MWW	9	4	570	W9JHS	9	3	—
W5ML	9	3	700	W9HXY	9	3	—
W5ABN	9	3	780				
W5ERD	8	3	570	VE3AIB	20	8	890
W5VX	7	4	—	VE3DIR	17	7	790
W5VY	7	3	1200	VE3BQN	14	7	790
W5FEK	7	2	580	VE3BPB	12	6	715
W5ONS	7	2	950	VE3AQQ	11	7	800
W5FBT	6	2	500	VE1QY	11	4	900
W5IRP	6	2	410	VE3DER	10	6	800
				VE2AOK	7	3	440

OES Notes

W2UTH, Rochester, is working on camera gear, but progress is slow because he is scouting new locations. Owners of high-altitude real estate take notice.

(Continued on page 138)

How's DX?

CONDUCTED BY ROD NEWKIRK,* W1VMW

How:

Bet you figured, as we did, that the principle of f.s.k. has been monopolized in application solely by us brainy and supercivilized moderns. Not so! As well-traveled ON4FG/OQ5FG/OQ0FG entertainingly points out, you'll have to go a bit further to find something new under the sun. Fact of the matter is, African natives used such a system in their "jungle telegraph" long before Hector was a pup.

Their transmitting gear, good for river-valley ranges that exceed 15 miles under optimum conditions, consists of hollow-log drums, pairs of hardwood clubs and some well-conditioned biceps



Two Belgian Congo rhythm crews join forces in the Congo-Ubangi district of Equateur province. The gear at right is communications-style equipment.

The drums, equivalent to cylindrical-type tuning forks, are slit lengthwise at top and each is scraped thinner on one side for two-toned output.

This construction style is common to most Congo tribes but "telegraphic" codes vary all over the place and are frequently changed as needs for communications secrecy arise. Given tribes usually can be identified by the "keying" characteristics of their respective communicators.

These native communications experts, phenomenal performers who can hammer away all night at many beats per second get their jobs through family connections and by more or less growing up in the business. While such log-thumping communicators actually are officially-designated specialists, all tribesmen automatically develop a subconscious facility to "read the mail" with ease. They enjoy flabbergasting Caucasian observers with the amazing efficiency of their tom-tom networks and it isn't easy to pump them for specific info on the subject.

As an example of jungle-telegraphic proficiency, OQ0FG recounts an episode wherein he successfully requisitioned a desperately needed truck axle by this means over an approximate distance

of 100 miles. The stunt, says Gaby, must have required roughly 20 relays and almost as many code-system translations and interpolations.

How's intertribal DX? Well, it appears that all Congo communicators are strictly traffic men — no one yet has agitated for the installation of a WAT (Worked All Tribes) award.

The world of DX loses a worthy scribe as Art Milne, G2MI, relinquishes DX editorship of the *RSGB Bulletin* in order to assume higher official duties (President, no less!) for the Society. Art's thirteen years of concise DX reporting leave enormous shoes to be filled. G3ATU has tackled the task and, from what we hear, will take the job in stride.

What:

"Mr. Roberts," famed in contemporary U. S. drama for his tiresome journeys from Tedium to Apathy by way of Ennui, has a British namesake who is pulling a higher switch on the dialogue. Bob Roberts, G2RO, continued his massive assault on the DX-Countries Operated-In record well into December, adding a few Caribbean countries to the Baedekerian RO ham log. The RO archives now include QSOs made under such prefixes as VQ1 VQ3 VQ4 VQ5 VP1 and VP7. So far no one has suggested an "all-RO" DXCC award although several of the gang have been trapping him all along the route. "Official business" is the means by which he manages to gad about with such agility. Asia next!

Well-traveled W6UXX recorded his first successful attempt to put Cores Island on the air. Not many guys caught him this time but at least the ice was broken in mid-November. W8BKP told W1WPO that TI9UXX evidently made over thirty contacts on 14 and 7 Mc., these with extreme difficulty. Nice going, OM. . . . Continuing on the subject of twenty c.w., then, W9TGY came up with F8AY (14.020), G2PZC (633), TA3AA (008), VQ3EO (032) and ZS3E (090) — 63 countries on 40 watts so far. . . . GD3s FBS (040), IBQ (037), MF2AE (070), SP1KAA



* DX Editor, QST.

(0720) and **TF3MB** (040) came back to **W2EBV**, all stations worked before 0730 A.M. EST. **W3EKN** rotates a half-wave radiator for stiff like **CR6AI** (050), **FA8JO** (017), **FQ8AF** (080), **IS1AHK** (011), **LZ1KPZ** (060), **PJ2CH**, **SP2SJ** (051), **SV0WE**, **TF3KG** (052), **YU4ALM** and **ZB1TD**. Herman uses 500 watts plus a 75A-2. **W1ORP** mailed **KA2AA** (073), **KB6AY** (062) and **VS6CG** (075), but **ZC3AA** escaped. **W3APQ** worked Rio de Oro, while **K6BTE/1** furnished Rhode Island for **W0CCA/KG6** (060) with a mere 616 crystal oscillator.

Operating school station **W3MWL**, **W3ULI** dug up **ET2US** (045) and **VQ4QQ** (150). **SP3AN** (080) and **3V8AN** (098) QSLs are anticipated by **W21YO**. **M1T's** **W1MX**, **W4YHD** keying, racked up **OQ5VN**, **SP9KAD**, **ST2AR**, **VQ2AB**, **ZS3T**, **4X4DF** and **SU18S** (009). **EA9DD** and **VQ1NZK** were countries. Nos. 200 and 205 (20-meter Nov. 200 and 199) for friend **KP4KD**.

OQ01Z (same country as **OQ5**) and **ZD9AA** (047) set well with **W8DLZ**. **C3s** **AV** (014), **BF** (012), **KR61X** (012), **KX0BF** (029) and **VP7NV** (014) **QSO'd** **W7RME**. Several interesting ones at **W4ZAE**: **FB8ZJ** (087), **LB8YB** (082), **VR6AW** (009), **ZC5s** **VS** (081) and **CZ** (070). **W3MPG** reports QSLs from another DX journeyman—**FBUTU**—**VQ7UC**—**VQ9U**—**VS9U**—**U**. Rex also contacted off **FK8AG** (005), **IS1V** (058), **J20KF** (025); see "Tollans", **OD51C** (085), **VQ5AD** (075), **VS9AD** (066) and a 3V8 to bring him to 215 worked. Spokane's **W7CSW** has **ET2PA**, **KATRC**, **KF3AB**, **LU8** 1ZQ 2ZQ 3ZQ, **MP4BHD**, **OD51X**, **ZB1CA**, **ZC4IP** and **ZP5AY** to recommend. Ground-planes really work in **W7I** Ryder has new **CAA** and **WAJAD** certificates. **HR1AT** and **KA2WW** raised Utah through the courtesy of **W7QDJ**.

Business is booming at **W3ANT**: **CE7AK**, **CR5AC**, **EA9AB**, **FB8RE**, **FQ8AS**, **JA1CJ**, **LU3ZS**, **TG0s** **CR** **RB**, **VQ2CW**, **VP8AJ**, **ZS3JP** 5JA and **ZS8D** but the duct **CE7ZC** (041) 1745, **CN2AD** (068) 1320, **VP8AT** (028) 1800, **VU2CS** (002) 0800, **YL2AM** (028) 0730 and **ZC5VM** (108) 0700 are recorded by the West Gulf gang's *DX Bulletin*, times CST.

Twenty 'phone seems to be duck soup for **VE5HR**. On Hal's A3 check-off list we find **CP5AB**, **FQ8AD**, **HH3DM**, **HR1s** **JM** **UA**, **KF3AB**, **OX3BG**, **PJ2AF**, **TF3AB**, **TG0s** **AI** **RB**, **TL2EL**, **YL2AM**, **YV8** 1CB 5FL and **ZP3CF**. **HK1s** **DP** **VF** and **JO** also appear, Colombians being easier to catch by voice nowadays. An 814 at 75 watts, dipole and long wire do the trick. **CS3AC** (14,170) and **YS4AA** (150) chatted with **W2EBV**. **ET2US**, **ZS3U**, an **EA9** and **3V8AN** raised **W3MQK's** 'phone tally to a respectable 113/96—won't be long now! **W3MWL** (**W3ULI**) also captured **CS3AC** while **W4ZAE** contented himself with **KB6AY** (172) and **VP8AR** (110). **CT3AN** (175), **FF8AP** (120), **VQs** 21DC (095), **5EK**, **YN1AFM** and **YS1MS** (310) bring **W1WQC** up to 104.

Fifteen has certainly earned itself a top spot on this Band Parade. **GD6IA** reports to **W4DOU** that he has 96 countries on 21 Me. **OA1C** is up to No. 73. Late good ones at **W4DOU** (A3) include **CR6BX**, **FF8AP**, **GD6IA**, **OQ5EB**, **VQ4IRF**, **YL3WH** and **ZS9C**. Ross puts 70 watts into a 4-element stacked array for 10 and 15 meters. **W7QDJ** had this c.w. luck (times GCT): **KB6AY** 1939, **KG6ADY** 2305, **KX6BF** 2230 and a flock of **VK-ZL** brethren between 2000 and 2330. Among **KP4KD's** trophies we see **CP5AB**, **HC1MB**, **HK4FV**, **TA3AA** and **TL2TG**. By golly, Ev finally has his 'phone **WAC** after forty fruitful years of hamming! Eight more states on 21 Me. will give **KP4KD** **W8AS** on five bands. Back to c.w. **W1MX** (**W4YHD**) accounts for **CP5JK**, **H1BLF** of Trieste, **IS1AHK**,

LU3ZS, **SP3s** **AK** and **AN**. **W21YO** was pleasantly surprised by his initial shot at fifteen c.w. **EA9AP**, **FA8IH**, an **I1** in Trieste, **ZB1BU**, **ZE3JO** and **4X4BX** **QSO's** resulted, all around high noon. **W6ZZ's** statistics show 59 21-Me. countries, 51 on 'phone. Here's what Miles just salted away on A3: **CE3AG**, **CXs** 3BH 5AF, **DU7SV**, **FO8AD**, **HP31L**, **JA1s** **CO** **DM**, **KA5** 5RC 7RC, **KG4AN**, **KG6AEX**, **KH6s** **AR** **IB** **LI** **MG** **UL** **YH**, **KJ6s** **BA** **FAA**, **KL7s** **ALI** **AOS**, **KR6LI**, **KV4AQ**, **KX6BH**, **OA1N**, **PY2JU**, **VKs** 2AMD 4HD 4TN 4WF, **VPs** 5SC 6FV 6WR, **VQ2s** **AB** **HA**, **VR2CG**, **ZE2JK**, **ZIs** by the handful, **VZ1K**, **ZSs** 3E and 9C. On c.w. **W6ZZ** cornered **CE6AB**, **CP5EK**, **DU7SV**, **JA5** 1CO 1CR 3AC 8AG, **KB6AY**, **OA1C**, **PF3QX**, several **VKs**, **VPs** 4LZ 9BG, **XE18A**, **YV5BZ**, **ZK2AA** and a half-dozen **ZIs**. Some band! Incidentally, **W6ZZ** has added the first 21-Me. 'phone **WAS** to his laurels, **W3UVT** of Delaware being No. 48. He has also **QSO'd** **ZL1BY** on air bands, a recent 27-Me. **QSO** rounding out the trick.

W6MYG, who works his own share of good stuff, tells us that Novice **DXer** **WN6TJ1** worked **KV4** **LU3** **OA4** **T12** **VK2** **ZL1** and **ZL4** before tackling his General. Several of these were c.w.-to-'phone work. **W6BYB** reached 42 countries on 21 Me. by way of **CR7AF**, **FA8CR**, **HR1AA**, **KL7PI**, **KR6AA**, **OQ5GU**, **VP6EB**, **YN1AA** and **ZE3JP**. **FF8JC** got away. Fifteen-c.w. catches **EA9AP**, **FA8RJ**, **HCL1W**, **LU9EV**, **OQ5CP**, **VQ2DT**, **YU3BC**, **YV5DE**, **ZB1BU** and **9S4AL**, carried **W5VIR** up to the 21-Me. 65-country mark.

Now let's see what the boys have been scraping up on forty. **W3AXT**, scraping with the best of them, comes up with 7-Me. c.w. trophies **CR4YG**, **HA5** **ITA** **70L**, **KB6AY**, **LU3ZS**, **SU18S**, **TF3AB**, **VQs** 2GW, **3KIF**, **VP8s** **AD** **AK**, fast-QSLer **XE3AH** and **ZK1AB**. **DU7SV** 1410, **HH2OT** (7011) 0401, **HR1AT** 0527, **T12PZ** 0555 and **W5QDF/KG6** 1422 were collected by **W7QDJ**, times GCT. **W1MX** (**W4YHD**) found **CP5EK**, **CR7LU**, **CX1FB**, **EA5** 6AF 8BF, **ET2US**, **FF8JC**, **I1NU** of Trieste, **KX61Z**, **OQ5s** **CP** **GU**, **SP9KAD**, **YQ3s** **RD** **RF**, **4X4s** **BX** **RE** and South Shetland's **LU3ZS** available on 40. **KP4KD** made it 96 7-Me. countries with **FK8AO** and **TF3MB**. **LB8YB** of Jan Mayen, **VK1RL**, **VP8AW** and **ZD2DCP** knocked off **W2QHII**.

W2OLU overheard **HB9FS/MM** (Swiss Navy?) working one **HE9ECS** around 2220 GCT on 7018 kc. **HE9LAA** is supposedly the only **HE9** amateur ticketed at present. **PJ2CB** and **SP3PL** raised **K2CW** while **W4TAS** ran into **5A1TM**. **W2DOD**, up to 180 7-Me. countries, added many of those previously listed, as well as **VR2AS** (010), **ZE3JP** (015) and **ZK2AA** (010). The Europeans no wild over **KZ5CI** and **Buck** has a long string of 'me. **KZ5CI** is **W3QYG** when back in Pittsburgh. **FF8AP**, **KH6PA** **KJ6**, **P21WX** and **YS1O** were captured by **W8UZF's** ground-plane. Not much cooking on 40 'phone of late but **W1ATE** had a good 18-country week end not long ago.

Eighty, another band with its ups and downs, is just beginning to boil and bubble at this writing. Recent catches hither and thither on 3.5-Me. c.w. follow: **W1MX**: **CT3AB**, **EA8BF** and **SP3AN**, **W1ORP**: **YU4ALM**, **W3UOE**, **VP6EB** (3515) and **YV5FH** (30), **W4YZC**: **EL9**, **FA8DA** and **9S4AX**, **W7DDY**: **ZD9AA**, **W7QDJ**: **KL7AWB**, **KH6MG** and **PM**, **W8BKP**: **DU7SV** (18) at 0612 EST.

Ten meters may be making ready to start on the long road back. **W4NQM** lists the following DX stations recently worked on 28-Me. 'phone: **CXs** 3BT 7BK, **HC1MB**, **HPs** 2HG 3DA 3FL, **KG4AO**, **OA1s** **CL** **N**, **OQ5RU**, **PJ2AP**, **PyS** 1AGP 1AKM 1AVG 2ADT 2AHS 3AGP 4AS 7DK 7XQ, **VPs** 5EM 6FR 6HR, **YV3s** **BA** **BD**, **ZSs** 1BV 1JE 1MP 1P 6JF 6QO and dozens of **LUs** in all call areas. Twenty-eight 28-Me. watts got 'phone items **LU8** 3CH 4DZ1 6CY 8AM 8DDI, **OA1N**, **PY7XQ**, **VPs** 5EM 6FR, **XE1GE** and **ZS6OP** for **W4WYM**. He operates in "QRP Alley" (formerly known as "Kilowatt Alley"). The 20-watter at **W3MO** took the measures of **HC1MB**, **HP3DA**, **HR1UA**, a bunch of **KZ5s**, **LU3CH**.

Jim Davis operates **JY1US** in the Kingdom of Jordan with 225 watts input to an 813-final rig on c.w. or with a lower-powered **TB8-50C** transmitter on 'phone. He has an Italian-model **VFO** ahead of these rigs and receives with an **HQ-129X**. **JY1US** employs dipole antennae and may be worked on several DX bands.

QST for





Rio de Oro expedition station EA9DD, operated by EAIBH (seated) over a 10-day period in October, 1953, logged 2246 QSOs with 132 countries on all continents. A Collins transmitter, Super Pro receiver and multi-band vertical antenna were used. During 1436 hours of on-the-air action 80, 40 and 20 meters saw service; 15 and 10 meters were available but poor conditions precluded their use. EAIBH and Spain's IRE society guarantee that all contact-confirming QSLs received will be answered by swift return confirmations.

PY3AGP, VP6IR and ZS6OQ. . . . W4SCU in Atlanta is another guy who has noticed definite signs of 10-meter renaissance. Clyde lists CN8CS (28,250), CX3BT (447), several LUs, PJ2AP (400), YV3BD (340), ZS1-BV (200), JD (100), KK (150) and MP (491). . . . For the benefit of newcomers who don't know how sizzling-hot ten meters can get in good years, let us again call attention to WIMCW's fine 168-country total on 28-Mc. phone.

One-sixty meters provides a strong finis for our monthly band-by-band report. Via W1BP, ZL1AH reports three antipodal QSOs with G6GM beginning mid-October, marking what is to our knowledge the first 12,000-mile contacts on 160. Incidentally, W2WWP's previously reported QSOs evidently were the first Atlantic seaboard-ZL 160-meter contacts. The ZL1AH-G6GM successes were the fruit of well-planned schedules that began in late September. . . . W2QHH has it that 4X1s now are pessimistic about their obtaining permission to work 1.8 Mc. Too bad — they'd make good bets for Asian work. . . . October 1.8-Mc. report via W3RGQ: Ws 1LYV 3RGQ and VE1EA got across to G3PU. G3PU made two-ways with Ws 1LYV 3HL and 3RGQ. G3PU reports a consistent signal from WOPNE of Illinois. Other stations reported heard in England are Ws EFN EPE VDB, Ws EQS GGL LRW, W3TGB, Ws KFC and POB. . . . W3RGQ's *Top Band DX* bulletin lists actual or imminent 160-meter activity on the parts of GC4EML, EI9J, HA5 5BQ 5HT, HB9s CM HT, VP4LZ, YO4 4CR7FX and 3A2BM. . . . A letter from ZC4CA starts out: "Over here we are planning a combined effort on the 160-meter band this winter. . . . ZC4s CK FB GF and myself." Skim expects they'll be running 20 or 30 watts to an 807 with various experimental long-wire antennas. There you are — anybody need Asia on 160? . . . W9NH's QSO with LU4DM (1907) indicates the current availability of another South American on Top Band.

Where:

The complete and revised listing of world-wide QSL bureaus that appeared in last month's *QST* (p. 66) clears our decks of general bureau comment for January. When

changes or additions come to our attention we'll run them in this spot, as usual. Here are individual items that may boost you toward some fancy wallpaper:

ex-DL4XX, E. Dean Roberts, 633 N. 4th St., Milwaukee 3, Wis.
ex-FF8AN, M. Veler, 1 rue du Gal Leclerc, Charente (Seine), France
HRTCB, Pedrotrado Sulsona, % American Embassy, Tegucigalpa, Honduras
JA3BC, Box 28, Wakayama, Japan
K6BWB/VQ2, APO 863, % Postmaster, New York, N. Y.
ex-KA2AA-KA9AA, Col. F. B. Westervelt, Surgeon, Ryukyus Command, APO 331, % Postmaster, San Francisco, Calif.
KA2GP/QSL via W7LEB
KC6AF, Dr. Herbert Schwartz, Yap Island, Caroline Islands
KF3AB/QSL via W2LXP
ex-KG6AEJ, Robert A. Nelson, W9AYS, 4002 Alder St., E. Chicago, Ind.
KG6AUA, (ex-W4ROK KG6) % U. S. Naval Communication Sta., Navy 926, FPO, San Francisco, Calif.
KX6BB, Box 34, Navy 824, % Postmaster, San Francisco, Calif.
KX6BE, Connell, Box 3, Navy 824, FPO, San Francisco, Calif.
LU3EX/LU5BM, Alfredo E. Lieberworth, Casillo Correa Central 4553, Buenos Aires, Argentina
LZ1KPZ, Box 830, Sofia, Bulgaria
ex-PK1LZ, C. Lee, Dtl., Purnawarman 47, Bandung, Indonesia
PK6RN, Airfield Penfong, Kupang, Timor, N. E. I.
T91TH, (QSL to W6ITH)
T91XX, (QSL to W6UXX)
VK9MG, G. W. Mullins, % M. V. Wallach, Lighthouse Tender, Samarai, Papua
VK9WZ, (QSL via W1A)
VQ1NZK, (QSL to W6NZK)
VQ8AY, (QSL via G2RO or RSGB)
VS1GB, Frank Linn, 6 Carrhill Circle, Singapore, Malaya
W3OFM/VQ2, A. Salitros, ET3, Naval Station, Argentina, Nfld.
YB1WH, (QSL to G3WH or via RSGB)
ZC4CA, J. R. Simpson, 20 Gordon Rd., Four Mile Point, Famagusta, Cyprus
ZC4CK, (QSL via ZC4CA)
ZC4FB, (QSL via ZC4CA)
ZC4GF, (QSL via ZC4CA)
ZC5VM, Sgt. Mills, RAF Det., Laluan, British North Borneo
ZS8MK, (QSL via G5RI)
ex-3A2AB-LX4FS-DL4FS, (QSL to K6AQF)
ex-3A2AY, (QSL to G6LX)

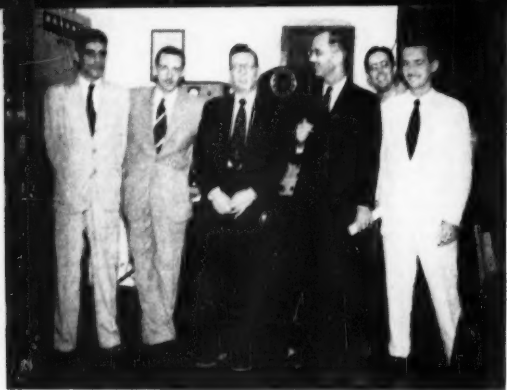
NOTE: QSLs for British Empire African and Caribbean calls ending in "RO" may be dispatched via RSGB.

W1s RWS WPO, W2s AOS/RG6 GT LYO, W3s AXT EH, W4SCU, LeRoy Waite, West Gulf DX Club's *DX Bulletin*, Southern California DX Club's *Bulletin* and friend ZC4CA started off our "Where" new year right.

Tidbits:

Asia — The Straits gang remains quite active despite more or less moribund propagation conditions. VS1FJ (ex-VS2CZ) works out of Singapore well on 14-Mc. phone with his 6V6-807 combination at 20 watts input, a dipole and a worked-over BC-779 receiver. VS2DS rides 20-meter c.w. with a similar c.f. line-up but likes a BC-312 inductor. . . . ZC4RX, G3FNF and ex-SV1RX-SURX — all same guy. Norm likes Vee beams for DX work from Cyprus. . . . Pete of VS7XG, or G3HVG when back in the United Kingdom, prefers 14-Mc. c.w. with 50 watts and a dipole. Friend VS7LB does well on the same band with 25 watts (VFO and 807 final) into a dipole while receiving with an HRO. Ceylon is pretty gaudy stuff from the States under current conditions. . . . VS9AS, the voice of Khormaksar, Aden, prefers 14-Mc. work with an 807-final rig, an SX-28 and a long-wire radiator. You may have worked him as G2BMM or GC2BMM.

Africa — VQ4DO, via W2BUY, writes: "I now have no more cards left. Those that have not as yet received confirmation from me . . . can expect somewhat hence to receive typewritten confirmations of QSOs." That's the proper spirit — a QSL doesn't have to compete with Currier & Ives styling so long as it accomplishes the purpose. . . . Present FQ8AQ is old F8SPG. Pierre likes 10 phone with 50 watts, a ground-plane and an 8-40 receiver. . . . FB8AN writes, upon returning to France, that he has received only 281 QSLs for over 500 dishes out. That's not so good, to say the least. . . . Entrea and Ethiopia are still separate entries on the Countries List even though the former has adopted the ET2 prefix. . . . Ex-MP4BAB, now ST2NW, goes for 14-Mc. phone work.



SU1HS likes the same band, c.w., and is ex-G3HS-VU2HS. AP5B and AP5B/YA. . . . MI3LV gives 28-Mc. A3 a whirl now and then with his 829B final at 90 watts input, an 18-tube super and an end-fire folded-dipoles array. . . . ZE3JO was G280 from 1936 to 1949; he's up to 115 countries with his 30-watt 807 rig and AR-77E receiver.

Oceania — It looks as though we'll be getting legit JZ0KF (Dutch New Guinea) QSLs after all. PA0GN says he's okay; QSL via ARRL. . . . W2AOS is heading back to the eastern U. S. A. after quite a session as W2AOS/RG6. After February 1st he'll be reachable at his Call Book address. Chas forwards the following Oceania morsels: KC6AF plugs away on Yap with a 40-meter ARC-5 at 75 watts, intending 14-Mc. operation soon. Neighbor KC6AA is also modifying an ARC-5 for 20. KX6BE radiates regularly from Carlos Island. Hugh of ZC5VS makes plenty of noise with 20 watts and a half-wave wire. . . . W6UFS bespoke to WIs AW and YYM of a possible DX jaunt Simonward. K8GAB is currently perking there on 14 Mc. between 0500-0800 PST. . . . Stations with calls KG6R through KG6RZ will be emanating from Rota, Mariana Islands. . . . Interesting epistle from VK9YY of Lae, T.N.G.: "Here I am running 50 watts input to 807s in parallel with a 400-foot long wire strung through the jungle from tree to vine and vine to tree. The receiver is a BC-348M into a somewhat modified BC-453 for double conversion. Operation is limited to c.w. only, on 7 and 14 Mc. It is hoped in the near future to be on 80 c.w. as lately that band has been observed wide open. Power for the set-up is obtained from a 1.5-k.v.a. 240/110-volt or 25-k.v.a. Diesel generator. We are getting a new transmitter going with a pair of 6146s at 100 watts. . . . Many blokes reckon that with a New Guinea VK9 call you can't miss on DX but don't believe it; you have to battle as much as the rest. I will, however, admit that my record is a good 27 Ws in an hour one Saturday afternoon. I have been concentrating on Ws for months for my WAS and have the required number now but there is one thing that I am very disappointed in — the return of QSLs. I have QSLs nearly 150 Ws for only about 60 returns. . . . Should there be any Ws who have not received my cards I will be pleased to QSL again. . . . In the future I will only QSL on request and receipt. Conditions here have been very poor and the only band that seems to be consistently near fair is 14 Mc. . . . In the line of other VK9s now in New Guinea we have myself the only one active at Lae; inactive are 9GV, 9DS and 9HL. Others active are 9CS at the Lutheran Mission in Madang, 9WL at Chabai on Bougainville and 9RM at Zenag near Lae." . . . FO8e AB and AC are very close to DXCC membership, both informing W1WFO that they have less than ten countries to go to clinch the proposition.

Europe — W2GT finds that cosmopolite DXer Guy Kane, ex-3A2AB-DL4FS-LX4FS-D4AFS-W8SRB, is back at it once more as K6AQP at Dixon, Calif. Commercialists have found that spot a good DX location so Guy should make out okay. . . . ON4NC, who has had nearly 10,000 QSOs, is now up past 193 countries worked, a detail omitted from his picture caption last month. . . . H19LA reiterates the picaroon status of HEIC and adds that no U.S.S.R. QSLs have been showing up in Switzerland, either. . . . MB9s BJ and EU have been helping the OE13/FK88 gang pass out Austrian contacts. BJ has 150 watts, an HRO and a 20-meter half wave. . . . RSGB's 17th BERU Contest, the 1954 edition, comes off January

W3BSO, who has been spending considerable time in South America of late, contributes this picture of a recent Brazilian amateur gathering at LABRE headquarters station PY1AA. L to r.: PY1ARM, PY1ANU, visitor W3BSO, PY1ADA, PY1AQT and PY1ASS.

30th-31st. This one's all c.w. — the radiotelephony section has been dropped for lack of interest. It will be frustrating for W/Ks to pass up some of the exotic countries that always show up for this affair but let's not be obnoxious. . . . G3IDG, who has an enviable library of radio literature, extends cordial invitation for visits from W/VE amateurs passing through the Isles. Prior notice, of course, will be appreciated. "At present I am QRT pending the arrival of the Post Office officials to investigate a case of BC1 from my 10-watt 28-Mc. 'phone transmissions.'" [Things must be tough all over, Boss. — Jeeees.] . . . From PA0GT via W9FJI: "Got 147 countries now. Still trying to get New Mexico and South Dakota for my WAS certificate but conditions are very poor." PA0GT reaffirms that Netherlands amateurs did outstanding work in furnishing communications for the Great Floods of '53. . . . W6CUF is DL4ing across the water nowadays and writes W6AM that he intends a little DXpeditionary work with such possible prefixes as LX4, HE, M1 or HV. . . . ON4AU tells W1WFO that stalking Oceania on 7 Mc. is high sport from the Continent these days, a really tough haul. He has ground-planes for 7 and 21 Mc.; a gimmick puts the 40-meter fly on 20.

South America — Harrowing tale from flying radiop LUS3EX/LUS5BM: "In October I had a bad aeroplane crash with a Lancaster bomber in which I was radio operator. We fell in the Rio de la Plata near Buenos Aires about 8 kilometers from the coast. We were saved by two ships after 45 minutes in the water. Only the pilot and I escaped. . . . Alfred finds DX conditions much better at LUS3EX, rurally located, than at LUS5BM where he must contend with the usual midcity QRN. LUS3EX has a VFO-driven 4-250A at 500-800 watts, an HRO-5TA1 and a 40-meter half wave on 7, 14 and 21 Mc. He'll be gunning for top honors in the ARRL DX classic commencing next month. . . . Very popular HRCIB was formerly ticketed as ZP5BB and ZP5CB. . . . Having finally caught his breath after his Easter Island adventures, Luis of CE3AG captured EA9ID for his 234th country. Over 1000 CE9AA QSLs have been mailed out via bureaus. Luis would like it made clear that contributions solicited for the establishment of a permanent amateur station on Easter are on a purely voluntary basis.

Hereabouts — W4THZ has his eye on Guadeloupe for a possible summer DXcursion. Red tape, of course, remains to be sliced. . . . The first three LMRE (Mexico) "50P-50W" certificates went to XE1SA, IIVS and F90Q in that order. Write LMRE for full details on this award. . . . KL7AOC has eight countries worked with his vehicular set-up. "It's expensive, though — my gas mileage averages about 10 miles per gallon because of sitting in the car and trying to keep the battery up while hamming." Petrol is 45 cents the gallon up there! "My one ambition, so far as hamming is concerned, is to make WAC mobile. I'm afraid, however, that Africa will prove my downfall." The auroral effect raises hob with KL7 DXing and Harold describes a peculiar situation observed on the ground-wave signals of neighbor KL7ADR. "The aurora (and hence the scattering source) moves very rapidly and there is a noticeable Doppler shift of the scattered wave which results in the appearance of an interfering heterodyne of constantly changing pitch." . . . W6GPB can't seem to hit the winning combination for an EK1AO QSL. Any boosts? . . . W1JNV regretfully notes that traffic interest seems to predominate over DX matters among the KC, KJ and KW gang. . . . W9UTZ and W5PPI drop a line from Fletcher's Ice Island to say that KF3AB will be extremely active "on all bands." The boys assure that they'll QSL 100 per cent. . . . KG6AEJ withdrew to East Chicago, Indiana, where he'll renew DX acquaintances under the label W9AYS. . . . Formed to "to foster and stimulate interest and activity in DX operation," the new International DX Club, with headquarters in Buchanan, Mich., operates under the temporary officership of W8UDS, W6QD, W9IOP and W4KFC. . . . We have it on pretty good authority that Clipperton Island will be on the air during the 20th ARRL International DX Competition. All set?

A.R.R.L. COUNTRIES LIST • Official List for ARRL DX Contest and the Postwar DXCC

AC3.....	Sikkim	KU7.....	Alaska	VPS.....	(See CE7Z)
AG2.....	Tibet	KM0.....	Midway Islands	VPS.....	Falkland Islands
AG2 I.....	(See I)	KP4.....	Puerto Rico	VPS.....	South Georgia
AP.....	Pakistan	KP6.....	Palmyra Group, Jarvis Island	VPS, LU.....	South Orkney Islands
C (unofficial).....	China	KR6.....	Ryukyu Islands (e.g., Okinawa)	VPS.....	South Sandwich Islands
C3.....	Formosa	KR8.....	Swan Island	VPS, LU.....	South Shetland Islands
C9.....	Manchuria	KS6.....	American Samoa	VP9.....	Bermuda Islands
CE.....	Chile	KT1.....	(See CN2)	VQ1.....	Zanzibar
CE7Z, LU, VPS.....	Antarctica	KV4.....	Virgin Islands	VQ2.....	Northern Rhodesia
E.....	Easter Island	KW6.....	Wake Island	VQ3.....	Tanganyika Territory
CM, CO.....	Cuba	KX6.....	Marshall Islands	VQ4.....	Togo
CN2, KT1.....	Tanger zone	KZ5.....	Canal Zone	VQ5.....	Uganda
CN8.....	French Morocco	LA.....	Norway	VQ6.....	British Somaliland
CP.....	Bolivia	LA.....	Svalbard (Spitzbergen)	VQ8.....	Chagos Islands
CR4.....	Cape Verde Islands	LU.....	Argentina	VQ8.....	Mauritius
CR5.....	Portuguese Guinea	LX.....	Luxembourg	VQ9.....	Seychelles
CR5.....	Principe, Sao Thome	LY.....	Bulgaria	VR1.....	Gilbert & Ellice Islands
CR6.....	Angola	MY.....	San Marino	VR1.....	British Phoenix Island
CR7.....	Mozambique	MD1.....	(See I3)	VR2.....	Tai Islands
CR8.....	Goa (Portuguese India)	MD5.....	(See SU)	VR3.....	Fanning Island
CR9.....	Macau	MD6.....	(See Y1)	VR4.....	Solomon Islands
CR10.....	Portuguese Timor	MF2.....	(See I)	VR5.....	Tonga (Friendly Islands)
CT1.....	Portugal	MI3.....	(See I6)	VR6.....	Pitcairn Island
CT2.....	Azores Islands	MP4.....	Bahrein Island	V81.....	Singapore
CT3.....	Madeira Islands	MP4.....	Kuwait	V82.....	Malaya
CX.....	Uruguay	MP4.....	Trucial Oman	V82.....	Sarawak
DL, DJ, DM.....	Germany	MS1.....	(See I3)	V83.....	Brunei
EA.....	Philippine Islands	OD5.....	Lebanon	V86.....	Hong Kong
EA6.....	Balearic Islands	OE, MB9, FKSS.....	Austria	V87.....	Ceylon
EA8.....	Canary Islands	OH.....	Finland	V89.....	Aden & Socotra
EA9.....	Spanish Morocco	OK.....	Czechoslovakia	V89.....	Maldives Islands
EA9.....	Spanish Guinea	ON.....	Belgium	V89.....	Sultanate of Oman
EL.....	Eire (Irish Free State)	OQ.....	Belgian Congo	V91.....	Lacative Islands
EL.....	Liberia	OY.....	Greenland	W, K.....	United States of America
EP, EQ.....	Iran (Persia)	OZ.....	Denmark	XE.....	Mexico
ET2.....	(See I6)	PA.....	Netherlands	YX.....	Burma
ET3.....	Ethiopia	PJ.....	Netherlands West Indies	YA.....	Afghanistan
F.....	France	PK1, 2, 3.....	Java	YJ, MD6.....	Iraq
FA.....	Algeria	PK4.....	Sumatra	YJ.....	(See FUS)
FB8.....	Amsterdam & St. Paul Islands	PK5.....	Netherlands Borneo	YK.....	Syria
FB8.....	Kerguelen Islands	PK6.....	Celebes & Molucca Islands	YN.....	Nicaragua
FB8.....	Madagascar	PK6, 7.....	Netherlands New Guinea	YO.....	Routmania
FC.....	Corsica	PX.....	Andorra	YS.....	Salvador
FD.....	French Togoland	PY.....	Brazil	YU.....	Yugoslavia
FE8.....	French Cameroons	PZ.....	Netherlands Guinea	YV.....	Venezuela
FE8.....	French West Africa	SM.....	Sweden	ZA.....	Albania
FG.....	Guadeloupe	SP.....	Poland	ZB1.....	Malta
FG.....	French Indo-China	ST.....	Anglo-Egyptian Sudan	ZB2.....	Gibraltar
FK8.....	New Caledonia	SU, MD5.....	Egypt	(See VR1)	Christmas Island
FKSS.....	(See OE)	SV.....	Greece	ZC1.....	Cyprus
FL8.....	French Somaliland	SV.....	Dodecanese (e.g., Rhodes)	ZC3.....	British North Borneo
FM.....	Martinique	TA.....	Turkey	ZC6.....	Palestine
FN.....	French India	TF.....	Iceland	ZD1.....	Sierra Leone
FO.....	French Oceania (e.g., Tahiti)	TG.....	Guatemala	ZD2.....	Nigeria
FP8.....	St. Pierre & Miquelon Islands	TI.....	Costa Rica	ZD3.....	Gambia
FQ8.....	French Equatorial Africa	TL.....	Congo Island	ZD4.....	Gold Coast, Togoland
FR.....	Reunion Island	UA1, 3, 4, 6.....	European Russian	ZD6.....	Nyasaland
FU8, YJ.....	New Hebrides	UA9, 0.....	Soviet Federated Soviet Republic	ZD7.....	St. Helena
FV.....	French Guinea & Guine	UB5.....	Ukraine	ZD8.....	Ascension Island
GC.....	Channel Islands	UC2.....	White Russian Soviet Socialist Republic	ZD9.....	Tristan da Cunha & Gough Island
GD.....	Isle of Man	UD6.....	Azerbaijan	ZE.....	Southern Rhodesia
GI.....	Northern Ireland	UE6.....	Georgia	ZK1.....	Cook Islands
GM.....	Scotland	UF6.....	Armenia	ZK2.....	Nue
GW.....	Wales	UG6.....	Turkoman	ZM.....	New Zealand
HA.....	Hungary	UH8.....	Uzbek	ZP.....	British Samoa
HB.....	Switzerland	UI8.....	Tadzhik	ZS1, 2, 4, 5, 6.....	Paraguay
HC.....	Ecuador	UJ8.....	Kazakh	ZS2.....	Union of South Africa
HC8.....	Galapagos Islands	UL7.....	Kirghiz	ZS3.....	Marion Island
HE.....	Liechtenstein	UM8.....	Karelo-Finnish Republic	ZS7.....	Southwest Africa
HH.....	Haiti	UN1.....	Moldavia	ZS7.....	Swaziland
HI.....	Dominican Republic	UP2.....	Lithuania	ZS8.....	Basutoland
HK.....	Colombia	UQ2.....	Latvia	ZS9.....	Bechuanaland
HL.....	Korea	UR2.....	Estonia	3A1, 2.....	Monaco
HP.....	Panama	VE, VO.....	Canada	3V8.....	Tunisia
HR.....	Honduras	VK.....	Australia (including Tasmania)	4X4.....	Israel
HS.....	Siam	VK1, ZC2.....	Cocos Island	5A1, 2, 3, 4.....	Libya
HT.....	Vatican City	VK1.....	Heard Island	981.....	Suez
I.....	Italy	VK1.....	Macao	.....	Albaidra Islands
I, AG2, MF2.....	Trieste	VK1.....	Papua Territory	.....	Andaman and Nicobar Islands
I3, MD4, MS4.....	Italian Somaliland	VK9.....	Territory of New Guinea	.....	Chipperton Island
I6, ET2, MI3.....	Eritrea	VK9.....	Norfolk Island	.....	Comoro Islands
IS.....	Sardinia	VO.....	(See VE)	.....	Friedhof Nansen Land
JA, KA.....	Japan	VP1.....	British Honduras	.....	(Franz Josef Land)
KA8.....	Bonin & Volcano Islands	VP2.....	Leeward Islands	.....	Hiti
JY.....	Jordan	VP2.....	Windward Islands	.....	Jan Mayen Island
K.....	(See W)	VP3.....	British Guyana	.....	Mongolia
KA.....	(See JA)	VP4.....	Trinidad & Tobago	.....	Neotian
KB6.....	Baker, Howland & American Phoenix Islands	VP5.....	Cayman Islands	.....	Qatar
KC6.....	Caroline Islands	VP5.....	Jamaica	.....	Rio de Oro
KC6.....	Palau Islands	VP5.....	Turks & Caicos Islands	.....	Tamou Tuva
KG4.....	Guantanamo Bay	VP6.....	Barbados	.....	Tokelau (Union) Islands
KG6.....	Mariana Islands	VP7.....	Bahama Islands	.....	Wrangel Islands
KH6.....	Hawaiian Islands	.....	.....	.....	Yemen
KJ6.....	Johnston Island	.....	.....	.....	.....



Correspondence From Members-

The publishers of *QST* assume no responsibility for statements made herein by correspondents.

TVI DEMONSTRATION

55 B-Elizabeth Rd.
Hampton, Virginia

Editor, *QST*:

Last evening I attended the ARRL lecture and demonstration by Mr. McCoy, WHCP, on TVI, at Norfolk.

There was quite a large group of servicemen there. It makes a ham feel good to hear such a lecture where it can do the most good to promote good will and understanding. I would also like to thank Mr. McCoy for his efforts and a job well done.

J. S. Williams, Jr., W4BFW

P. O. Box 476
Greensboro, N. C.

Editor, *QST*:

We as members of the Greensboro Radio Club want to express our appreciation for the very fine demonstration arranged and scheduled by the League, and carried out by your very able technical assistant, Mr. Lewis G. McCoy.

We had over two hundred technicians at our meeting here in Greensboro, and from all indications the meeting was a huge success. I believe it will be very beneficial to technicians in both TV servicing and amateurs.

We heartily approve of this action on the League's part in correcting TVI interference in all areas, and should the Club be called upon at any future time we will be very happy to comply with any future demonstration.

We enjoyed very much having Mr. McCoy with us and hope that you will arrange to send him into this territory again in the very near future.

Phil Wicker, Pres., GRC

RFD 1, Box 274-X
Jacksonville, Fla.

Editor, *QST*:

The TVI Demonstration given by Lewis McCoy was held here the evening of November 4th and was a great success.

"Mac" is a fine speaker and has developed a very interesting and informative program. The attendance numbered nearly 100 of which approximately 25 per cent were servicemen. Two engineers were present from the municipal power company and were quite pleased with what they learned.

We believe that Phil Rand's books on TVI which he has sent to all these demonstrations are of immeasurable assistance as a text in rounding out the program of recognizing and curing TVI.

So, thanks to the League, to "Mac" and to Phil Rand for what we think is the most important contribution to the Amateur-TV situation yet discovered.

Wm. A. Schell, W4UHE, Secy.
Jacksonville Ama. Radio Society

4614 Southern Parkway
Louisville 14, Kentucky

Editor, *QST*:

On behalf of the Amateur Radio Transmitting Society of Louisville, the Institute of Radio Engineers, and television servicemen and distributors in this area, we sincerely express our appreciation for the television-interference talk and demonstration given to us by Mr. Lew McCoy on Friday, November 13th.

In addition to the Louisville representation which made up the larger part of the audience, we also had ham and servicemen present from Owensboro, Frankfort, and Lexington, Kentucky. We are sure that each community stands to benefit from the valuable demonstrations, hints, and ideas which Mac so ably presented in his program.

Again, our thanks for a job well done. And we are grateful for the continuous work being done by ARRL in promoting

understanding of interference problems and in aiding in their being eliminated or reduced to the satisfaction of all concerned.

— Bill Latta, W4FTN

1733 Central Avenue
Cincinnati 14, Ohio

Editor, *QST*:

I had the pleasure of taking in Lew McCoy's TVI Show at the Alms Hotel here in Cincinnati last evening. I just wanted to pass on to you my word of commendation for a very excellent presentation — well done.

You are all to be congratulated for this very practical approach to a very complex problem. Please pass on to the Technical Department my compliments for the work and research that made this program possible.

That fellow Lew seems to be the "real McCoy" . . . he made a tremendous hit with the some 350 hams in attendance here and everyone liked the show.

C. C. Rickelieu, W1JR/8

311 Falls Rd.
Columbus, Ohio

Editor, *QST*:

I personally wish to take this opportunity of thanking the whole organization at West Hartford, for the presentation and work of your Mr. Lewis McCoy. Needless to say, his presentation represented considerable work on the part of many people there. . . .

— Bob Davis, W8EYE

DUAL CONVERSION STRIPS

211 Frankhauser Rd., RFD 3
Williamsville 21, N. Y.

Editor, *QST*:

You weren't kidding when you discussed anticipated 2-meter TVI with the "u.h.f. conversion strips." An official *QST* from local RL closely followed your November issue. "TVI on u.h.f. Channel 17 on a receiver two miles from my location!"

My own family had been watching u.h.f. Channels 17 and 39 ever since the stations first came on a few months ago, without a trace of TVI from my 2-meter transmitter, but how to convince a TV watcher who has just spent money for the conversion? Richard Shannon, W2ISI, of the local TVI committee investigated the complaint and is to be complimented on the fine job he did in placing the blame where it belonged.

I'm very happy to be a member of such a foresighted organization as ARRL. The advent of TV could easily have been the downfall of ham radio without ARRL! My sincere thanks to you all.

— Henry G. Kuhn, W2IRI

ILLEGAL PROCEDURE

2736 Alisdale, Apt. 101
Toledo 6, Ohio

Editor, *QST*:

For the past year I have noted the tendency among amateurs experimenting with television to stick the suffix "-TV" onto their calls. Of course, I do not know whether they ever actually transmit their call sign with the "-TV" stuck on the end. But the possibility does exist; and, for that reason, I decided to consult the FCC on the matter. As I had expected, they said that such usage was illegal. The text of their reply to my inquiry follows:

"The receipt is acknowledgment of your letter of October 29, 1953, in which you ask whether a radio amateur, when

(Continued on page 116)



Hints and Kinks

For the Experimenter



SUBBAND MARKINGS FOR HRO COILS

MARKINGS which indicate the limits of the various amateur subbands can be easily added to coil assemblies such as those used with my HRO-7 receiver. Along the bottoms of the face plates for these coils there is a space, $\frac{1}{2}$ inch wide by the length of the plate, occupied by the words "Band Spread." Take a piece of $\frac{1}{2}$ -inch white adhesive tape having a surface texture that will take ink or pencil and apply it to this area. Now, mark off the edges of the subbands to line up with the slide-rule calibration just above. In addition to the markings which indicate the frequency limits of the c.w., 'phone and Novice sections of a band, there is ample room on the tape for listing the type of service permitted, A1, A3, n.f.m., etc. — *Harry Engwicht, W6HC*

STOW CLAMP FOR MOBILE ANTENNAS

THE accompanying drawing, Fig. 1, shows a small homemade clamp that is used to stow a 28-Mc. whip whenever the car is to be garaged. In this particular case the clip is held in place by a strip

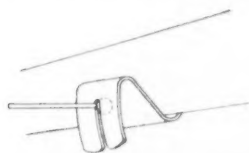


Fig. 1—Drawing of the antenna stow clamp used by W8TXE/4.

of chrome trim located on the side (at the rear) of a '52 Buick. However, almost all of the late models have at least one length of trim that can be used to secure the clip. Nice thing about the system is that it requires no mounting holes. — *Lt. Col. M. M. Konevich, W8TXE/4*

SOURCE OF SHEET ALUMINUM

MANY of us have come to think only in terms of large sheets whenever aluminum is required for a shielding project. These large pieces of material are frequently both difficult and expensive to obtain. One way to beat both the expense and the procurement problems is to make use of ordinary aluminum-chassis bottom covers. Usually, the assortment of sizes stocked by the local ham dealer will permit construction of an enclosure without involving a great deal of cutting and waste material. Of course, the over-all cost of the project will be dictated to some degree by the waste reduction factor. And if the various pieces purchased are approximately the correct size to

begin with, there won't be much left over in the way of scrap. — *Raymond H. Wilt, W1WYA*

MINIATURE LOW-LOSS CONNECTORS

A set of eight miniature low-loss connectors can be obtained easily and inexpensively by using the plugs and the prongs from an old octal tube and an 8-prong socket, respectively. The plugs can be readily removed from the tube base once the latter has been pried free and the socket clips slip out of place just as soon as the retaining catches are released.

By mating the salvaged components, you have a set of compact connectors that are easy to use, have good mechanical characteristics and are as low-loss as any obtainable. Naturally, the low-loss feature can be attributed to the absence of dielectric in or around the structures. — *Bill Pearre, W4TIZ*

MORE ABOUT THE GRID-PLATE OSCILLATOR

SINCE the Petersen Radio Co. presented the circuit of the grid-plate oscillator in an advertisement that appeared in *QST* for June, 1951, the oscillator has become extremely popular. However, some of the fellows have experienced difficulty in making the performance of the circuit live up to their expectations. Perhaps the following report of my own experiences with the oscillator will be of assistance to many *QST* readers.

In the circuit referred to above, C_1 and C_2 are the grid-to-cathode and the cathode-to-ground capacitors, respectively. It has been found that the ratio of C_1 to C_2 , and also the total capacitance of the two in series, are fairly critical. If C_1 is too large, the crystal current will be high and the harmonic output will be low. If C_2 is too large, the output will drop off and if it is too small, the crystal current will be excessive and the circuit will continue to oscillate when the crystal is removed.

The circuit, as shown in *QST*, is designed around a Type 6AG7 tube. Substitution of a different type of tube will require a different value of total capacitance or a different ratio of C_1 to C_2 . In some cases both the total capacitance and the ratio must be changed. To obtain both maximum harmonic output and minimum crystal current for a particular crystal-tube combination, it is advisable to use variable capacitors for the feed-back divider. A 3-30- μ fd. trimmer may be used for C_1 and C_2 should have a capacitance of 100 μ fd. or more. Ceramic trimmers may be used but their power factor is rather high.

(Continued on page 132)



Operating News



F. E. HANDY, WIBDI, Communications Mgr.
R. L. WHITE, WIWFO, Asst. Comm. Mgr., C.W.
PHILLIP SIMMONS, WIZDP, Communications Asst.

GEORGE HART, WINJM, Natl. Emerg. Coordinator
ELLEN WHITE, WIYYM, Asst. Comm. Mgr., Phone
LILLIAN M. SALTER, WNIZJE, Administrative Aide

Getting Behind ARRL in the New Year.

Each new year presents a challenge to amateur radio to make our individual and collective results more effective. This is not only to give more pleasure to ourselves, but that our work be more appreciated by others. We know of few hobbies that require authorization by *government license*. Amateur radio has the collective strength of that number of amateurs who will work for common objectives. Making the most of Amateur Radio must then be spelled out by full participation in ARRL projects and activities as these are announced in the New Year. We start this month of January with the Novice Round-up, V.H.F. Sweepstakes and CD QSO Parties. Such tests of operator and equipment ability serve to develop capabilities for our more public accomplishments as communicators. As we enter the New Year our ARRL Emergency Coordinators (and Radio Officers) are implementing radio plans for stand-by civil defense communication at regular intervals as encouraged by authorized local officials. Our RMs and PAMs are likewise organizers of a continuing traffic facility. The National Traffic System is based on full interconnection of section and other nets. These organizations, "of, by and for" the amateur, are only as strong and effective as you make them; the limits of success are largely circumscribed by your participation or lack of it.

Through *organization* we can achieve more in having our communications efforts accorded due respect as well as greater results individually. ARRL is our organization; it renders operating, technical and representative services; it calls for our best in individual activity, in ideas and support and loyalty. Station appointment responsibility and participation in nets, FD tests, and other projects further both group and individual communication results; awards for CP, WAS, etc., show our personal progress as individual amateurs; the aggregate sum of it all reflects favorably on our institution!

This is a cordial invitation to use all the ARRL services, appointments and award provisions such as represent continuing benefits in individual operating efforts. During the coming year let each of us spend at least *some* time in participation in those projects that add to the public-service record of the amateur as well as to our personal stature in the community. Leadership posts such as EC, RM, PAM, participation in RACES or in one's local traffic networks, acceptance of voluntary responsibilities that help the newcomer or put over club projects coopera-

tively — all these things we can and must do to strengthen our Amateur Radio. The best part of it is that in doing each of these things we at the same time are bound to achieve a heavy return in individual pleasure, widened fraternal acquaintances, increased know-how and results!

"Famous Fone Expressions" (By WIPID). The following is a compilation of meaningless expressions that slip out occasionally in voice operation and which may cause some slightly red faces — including our own. By examining these phrases, we can see how a little thought will avoid them and help to increase the dignity of our operation:

"You're blasting through fine business. Please repeat your handle and QTH."

"You are 20 db. over S9 on a very Scotch 8-meter."

"So we will turn it right back to you."

"WIPID now signing clear, but will come back on the next round for a final final."

On Roll Calls and Net Policy. The following from W7FLX (Nov. PANN): "We have recently reverted to our old form of roll call wherein the NCS calls the net (WSN) and members answer automatically without individual call-ups. Traffic is cleared as reported and then another general call is made and the process repeated until no more stations report in. If a net gets to the size where a roll call takes more than 10 or 15 minutes at most, it should be split up into two or more divisions. Nets should have the same end product in mind, the accurate and speedy handling of messages. How well a net is run depends on the members' willingness to conform to a proper routine. If accuracy and speed are desired, there is no room for unlimited rag-chewing. Anyone wishing more on how to run a net may well spend a week or two listening to various nets, 'phone and c.w., logging the time spent on roll call, traffic and social exchange in evaluating net efficiency."

160-Meter Band Opportunity. To take advantage of excessive "skip" and lick the propagation cycle, more amateurs will broaden their efforts by bandswitching up to 160 this season. Arrangements for a "top band" DX Test have been completed by WIBB and G6QB. See the announcement of 160-Meter Transatlantic Tests in "How's DX?" of December QST. The optimum time to get across is suggested as midnight to 3 A.M. CST. Nightly activity is assured in the first three months of the new year. For concentrated efforts with a maximum number listening and transmitting, and after a general warm-up Dec. 20th, be on hand on 160 Jan. 3rd, 17th and 31st, Feb. 14th and Feb. 28th, and March 14th.

U. S. and Canadian amateurs are asked to transmit the first five minutes and alternate five-minute periods, listening the second five minutes and alternate periods, checking time on WWV.

One-sixty is a good band for reliable net operation and especially as an alternate to 75- and 80-meter frequencies. It will function to carry through successful signals at times when the higher-frequency bands are utterly washed out. W5MBP writes to suggest also that 160 is a better mobile band than 75 — and a way to get away from excessive interference on that band as well as to find tolerable propagation conditions. He reports W5QFK is NCS of the Blue Ridge 160 Emergency Net (1880 kc., Sun. 0830) which has been ARRL-registered this year as for some seasons past. So this is by way of suggesting a greater net use and mobile use of 160 where feasible. Registration of your plans after study of net registrations on file with ARRL is probably even more essential if you plan to use 160, though, since there are fewer kilocycles to go around and some greater separations in net time may be required to minimize interference.

Then and Now. DX used to mean working the antipodes, or overseas QSOs, in almost every case. Today it also may refer to a new 2-meter record, a new 100-Mc. band contact for the v.h.f. experimenter, a new state for the teletypewriter or the Novice or some new daylight record attained on the 80 or 160 band. These new v.h.f. and other records are noteworthy as DX in the bands they represent — and for this part of our propagation cycle! The point-standing your EC can show for your city in the Simulated Emergency Test, the club's Field Day record compared to what it did last year, the BPL total made up of good traffic handling for other amateurs and non-amateurs — these are all continuing criteria of the broader meanings that each of us must continually write into amateur radio by our activity!

Fellows who can work all bands are in the best position to capitalize on every operating opportunity as it comes along. Many more rigs are completely versatile and bandswitching now than even ten years ago. Many fellows with fixed stations now also have car mobiles or emergency-powered home rigs separate from the big rig. Such equipments enable them to report in on the section c.w. or section 'phone net, as often as not working on emergency power and ready for public service should the occasion require. It makes for broader support of what we are all doing and greater unity in amateur radio to have it this way.

— F. E. H.

CODE-PROFICIENCY PROGRAM

Twice each month special transmissions are made to enable you to qualify for the ARRL Code Proficiency Certificate. The next qualifying run from WIAW will be made on January 13th at 2130 EST. Identical texts will be sent simultaneously by automatic transmitters on 1885, 3555, 7125, 14,100, 21,020, 52,000 and 145,600 kc. The next qualifying run from W8OWP only will be transmitted on January 8th at 2100 PST on 3590 and 7138 kc.

Any person may apply; neither ARRL membership nor an amateur license is required. Send copies of all qualifying runs to ARRL for grading, stating the call of the station you copied. If you qualify at one of the six speeds transmitted, 10 through 35 w.p.m., you will receive a certificate. If your initial qualification is for a speed below 35 w.p.m., you may try later for endorsement stickers.

Code-practice transmissions are made from WIAW each evening at 2130 EST. References to texts used on several of the transmissions are given below. These make it possible to check your copy. For practice purposes, the order of words in each line of QST text is reversed during certain of the slow-speed transmissions. To get sending practice, hook up your own key and buzzer and attempt to send with WIAW.

Date Subject of Practice Text from November QST
Jan. 4th: An Amateur Television Camera, p. 11
Jan. 7th: Tube-Keyed Grid-Block Keying, p. 16
Jan. 12th: Compact R. F. Assembly, . . . p. 17
Jan. 15th: A Simple Heterodyne Exciter for 10 Meters, p. 21
Jan. 19th: The Single Side-Saddle Linear, p. 25
Jan. 21st: Novice 80- and 40-Meter One-Tube Rig, p. 28
Jan. 27th: Color Television and the Amateur, p. 31
Jan. 29th: A 220-Mc. Station for the Beginner, p. 35

WIAW OPERATING SCHEDULE

Detailed schedules of WIAW operations appeared on page 73 of October QST and page 73 of December QST

DX CENTURY CLUB AWARDS

HONOR ROLL

W8HGW . . . 253	W2BXA . . . 244	W3JTC . . . 240
W1FH . . . 252	W6ENV . . . 244	W6SN . . . 240
W3BES . . . 250	G6ZO . . . 242	G6RH . . . 240
G2PL . . . 248	W6AM . . . 242	W4BPD . . . 238
W0YXO . . . 246	W3KT . . . 241	W8NBK . . . 238
W6VFR . . . 246	W3GHD . . . 240	PA0UN . . . 238

RADIOTELEPHONE

PY2CK . . . 229	W1NWO . . . 209	SM5KP . . . 204
W1FH . . . 224	W1JXC . . . 208	W1MCW . . . 202
VQ4ERR . . . 220	Z86BW . . . 208	W2APU . . . 202
XE1AC . . . 215	W8HGW . . . 205	W0RBI . . . 200

From October 15, to November 15, 1953, DXCC certificates and endorsements based on postwar contacts with 100-or-more countries have been issued by the ARRL Communications Department to the amateurs listed below.

NEW MEMBERS

T12TG . . . 201	PA0RL . . . 111	DL3ND . . . 104
OZ3PL . . . 158	E15C . . . 109	I1CZE . . . 104
CN8MM . . . 149	FA3JY . . . 109	W8LCR . . . 103
E14X . . . 148	HB9KO . . . 109	W2HSZ . . . 102
F8EJ . . . 141	KH5YL . . . 107	W4THZ . . . 102
OZ2PA . . . 116	W3NCF . . . 104	W1NHJ . . . 101
W3NCF . . . 112	W5KRU . . . 104	W4FID . . . 100

RADIOTELEPHONE

DL3EA . . . 110	W8LAV . . . 102	W5DMR . . . 100
OZ5BW . . . 108	4X1RE . . . 101	W5KBU . . . 100
W2BRV . . . 102		PY4PI . . . 100

ENDORSEMENTS

W3EPV . . . 225	PA0GN . . . 180	G3RB . . . 136
W3DPA . . . 222	W3LVF . . . 160	W5DMR . . . 133
W2YW . . . 211	W3WU . . . 160	W8YHO . . . 133
W1HX . . . 210	W0AIH . . . 160	I1CJW . . . 131
4X4RE . . . 210	KZ5WZ . . . 160	F3RA . . . 130
W6KYG . . . 187	W1HRI . . . 154	W6APH . . . 122
W8ACE . . . 184	W4ZD . . . 153	W1DSF . . . 120
W1AEW . . . 181	GM3CTX . . . 152	G5PQ . . . 120
G4ZU . . . 180	984AX . . . 143	W1ODW . . . 110
KL7PI . . . 180	SM3ARE . . . 142	W0FNN . . . 110
	W7RT . . . 140	

RADIOTELEPHONE

W3JNN . . . 190	LU4DD . . . 160	W5HFQ . . . 122
EA2CQ . . . 190	W3MAC . . . 141	W2PRN . . . 120
T12TG . . . 171	HE9LA . . . 140	ET2LV . . . 114



We never hear of the signal QRRR being used. This is the amateur's own distress call, an SOS from an amateur station in an emergency actually calling for assistance involving life and death. It used to be QRR, but an extra "R" was added when Atlantic City decided QRR should mean something about preparing for automatic operation.

The infrequent use of QRRR is as it should be. It is not a signal to be handled about in connection with an emergency, or in any other connection. It is a signal that each of us hopes he never has to use but which will mean something when it is used.

Some time ago, one of our correspondents (VE2ACE) suggested to us that the signal QRRR is really inappropriate, that its similarity to dozens of other "Q" signals might let it be transmitted over and over in a crowded amateur band without ever being noticed. He goes on to say that a signal which is composed of a repetition of easily-recognized characters has an electrifying effect on the casual listener. Although SOS is not too good in this respect, some of the other marine attention-attracting signals are — such as TTT (safety), XXX (urgent) and SSS (lifeboat). He suggests that the amateur adopt a similar signal for its emergency call, such as MMM, or OOO.

Our c.w. operators might give this some thought and make some comments. We ought to ask ourselves such questions as: (1) Do we need a distress call often enough to warrant having one? (2) Is the present QRRR really less appropriate than MMM, OOO or something else which might be a better attention-getter? (3) Is a change necessary, considering the frequency of use of our present signal? A few others will present themselves in the course of your cogitations. Let us know what you think, eh?

What about 'phone? The signal "Queen Robert Robert Robert" sounds just as good (or just as bad, take your pick) on 'phone as would "Mary Mary Mary" or "Otto Otto Otto." What is suitable on c.w. quite often is entirely unsuitable on 'phone, and vice versa. Do we want also a distress call on 'phone, or do we get along better by just using plain, old, understandable words?

A terrific storm on Lake Superior, on Sept. 12th, found three boys stranded on a small island. One of them was the son of W8CLW. Unfortunately, the Coast Guard was not immediately available, as they were busy with an ore freighter being beached about six miles away; then later the breeches buoy was out of commission and could not be used for rescuing the boys, who had to remain on the island without adequate food, shelter or clothing for several days.

Naturally, amateurs assisted W8CLW in setting up communications and arranging for rescuing the boys, a great many of them leaving their regular work to do so. Their families furnished food and coffee for the rescue workers, who were attempting to get to the island with ropes, life preservers and small boats. The waves were thirty feet high, making the operation difficult if not impossible. Amateur mobiles operated at the scene until their gas tanks were empty and their batteries dead, handling 'phone patches for the state police, the sheriff's office and the Coast Guard. Over a thousand messages were handled in the three-day

period. W8CLW and his XYL, W8EHL, wish to express their great gratitude for the help rendered by local amateurs and by other amateurs in Michigan and Wisconsin who assisted by keeping the frequency clear. The following were active: W8s CQG GEW GGO GJX HK IOC and VJD.

The boys? Oh, they sat out the storm and waded ashore after it was over, having been made comfortable by planes dropping supplies.

In Waco, Texas, on August 13th and 14th, a civil defense "Disaster Critique" was held. Committees were formed and asked to submit their findings and/or recommendations.

The findings and recommendations of the Committee on Communications are of interest because several of each relate to amateur operators. We think they are typical, so here they are: *Findings* — (1) Not enough hams to handle other than welfare traffic. (2) Equipment failures in equipment not normally used 24 hours a day. (3) Interference on 75 meters very bad. *Recommendations* — (1) Amateur radio operators should be assigned whatever functions the director of communications may see fit. (2) All radio base stations should be equipped with emergency power. (3) If additional amateurs are needed, a list of those in adjacent communities should be available and should be utilized. (4) Local amateur operations should be conducted on the very-high frequencies.

W2NFF says that all amateurs should have operating rigs in their cars. One foggy morning near the Pulaski Skyway in New Jersey, on Route 22, he saw a red glare ahead and soon perceived that there had been an accident. Investigating, he discovered that a woman was injured in the wrecked car and there had yet been no way of summoning medical assistance. W2NFF fired up his rig, quickly contacted K2BHC/M in New York City who went to a telephone to summon aid. Immediately after, W2LEG/M in Newark called, and he too called for police patrol assistance. Within five minutes police were on the scene and in charge. It seems that W2KLA, who had been listening in his own mobile rig, had stopped a police car and dispatched him to the scene. All amateurs involved were mobile. Without this assistance, medical aid may have been long minutes later in arriving.

The Colorado River Association would like to give credit and recognition to W6s CMN, DDE, MBA and W7s JU and LGS for the splendid work they did in handling radio communications for the 1953 marathon. The purpose of the radio network was to provide rescue service for disabled boats and radio the position of each boat as it passed a check point. The net consisted of W7LGS portable at Parker Dam, W6CMN and W6MBA portable on the Arizona side of Lake Havasu, W7JU portable at Topock, Ariz., and NCS W6DDE at Needles. All stations except W6DDE were on auxiliary power. Reports from the NCS were telephoned to the judges stand by direct line. The net remained in operation until all boats had been accounted for and all rescue traffic had been cleared, which was several hours after the race was finished. The frequency used was 3535 kc., and communications were 100% at all times. Much emergency and rescue traffic was handled by all stations. W6CE was in charge of the whole operation.

There were 13 September SEC reports representing 3406 AREC members. All of the 13 were among the "old faithful," no new reporters. QST for January, 1953, reports 17 reports for 3362 AREC members, so we can see our AREC membership increasing but reports declining. So far this year 22 sections have submitted 114 SEC reports, while at this time last year 29 sections had submitted 157 reports.

It takes an EC perhaps 5 minutes to make out a Form 5 report card, an SEC maybe the better part of a half hour to complete and mail his Form 8 report each month. Is this asking too much?

Erie County (Buffalo), N. Y., held a full-scale CD Exercise on October 16th. Manning the control center (equipped completely by amateurs) are W2PPI (left) and Radio Officer W2PPY.



QST for

SUPPLEMENT TO NET DIRECTORY

The following list of nets will supplement and correct the listing on page 70, November QST. Please inform us promptly of any errors or omissions so that they can be included in the March QST installment. The lithographed net directory should be available upon request by the time this appears in print.

An asterisk (*) indicates correction from previous listing in November QST. This listing brings the record up to date as far as November 18, 1953. Registrations received later than this date will appear in the March QST listing.

Name of Net	Freq.	Time	Days
Ala. Emerg. Net Phone	3955	1830 CST	Daily
Albert Net (Conn.)	29,460	2000 EST	Fri.
	50,740		
	145,200		
Alberta Phone Net (APN)	3765	1930 MST	Mon., Wed., Fri.
Amesbury (Mass.) CD Net	29,626.8	1900 EST	Wed.
Anthracite Net (AN)	3610	1830 EST	Mon.-Fri.
Atlanta Forty CW Net	7150	2100 EST	Sun.
Atlanta Ten Phone Net	29,600	2200 EST	Sun.
Atlanta Two Meter Phone Net	144,138	2030 EST	Mon.
Badger Emerg. Net (BEN)	3950	1800 CST	Daily
Bergen Co., (N. J.) CD Net	29,510	1945 EST	Wed.
Bloomfield (N. J.) Communications Group	29,520	0930 EST	Sun.
Blue Ridge Net (Texas)	1880	0830 CST	Sun.
Boston Emerg. Amateur Net	28,700	1430 EST	Daily
Braintree (Mass.) CD Net	28,560	0900 EST	Tue.
British Columbia AREC Net	3755	1900 PST	Mon.-Sat.
Buckeye Net (Ohio) (BN)	3580	1900 EST	Mon.-Sat.
Buzzards Roost Net (Mich.)	3930	1730 EST	Mon.-Fri.
Calif. CD Net (CCDN)	3501	1900 PST	Mon.
Calumet Area Emerg. Net	1805	1900 CST	Mon.-Fri.
Central Area Net (CAN)	3670	2030 CST	Mon.-Fri.
Central Gulf Coast Hurricane Net	3935	1815 CST	Daily
Central Ill. Net	1815	0830 CST	Sun.
Central N. Y. Training Net (CNYT)	3720	1000 EST	Sun.
Conn. Phone Net (CPN)	3880	1800 EST	Mon.-Fri.
		1000 EST	Sun.
Cookeville (Tenn.) Net (CN)	3735	2200 CST	Wed.
Coronation Area (Alta.) Emerg. Net (CAEN)	3780	1000 MST	Sun.
Cranston (R. I.) CD Net	29,000	2100 EST	Thu.
	52,000	2200 EST	
Crawfish Net (CFN)	7175	0900 CST	Sun.
Dade (Fla.) Emerg. Net (DEN)	29,044	1930 EST	1/3 Mon.
Deep Sea Dragnet	3970	1145 EST	Mon.-Sat.
Delta 75 Net	3905	0730 CST	Sun.
Denver Amateur Radio Net (DARN)	29,624	1930 MST	Wed.
Dog House Net (Ohio)	3860	1800 EST	Mon.
Duluth Emerg. Net	29,600	2130 CST	Tue.
East Able Net (Pa.)	3915	0830 EST	Sun.
Eastern Mass. Net (EMN)	3660	1900 EST	Mon.-Fri.
Eastern Pa. Emerg. Net	3610	1900 EST	Mon.
Eastern Penna. Net *	3610	1930 EST	Mon.-Fri.
Eighth Regional Net (SRN)	3530	1945 EST	Mon.-Fri.
FARM Net	3935	1900 MST	Mon.-Fri.
Fla. Phone Traffic Net *	3945	0700 EST	Daily
Frammingham (Mass.) Radio Club Emerg. Net	28,700	2045 EST	Wed.
Frammingham (Mass.) Slow Speed CW Net	3736	1930 EST	Wed.
Ga. Cracker Emerg. Net	3995	0830 EST	Sun.
		1900 EST	Tue., Thu.
Golden State Emerg. Net (Calif.)	3965	1930 PST	Daily
		1330 PST	Sun.
Great Lakes Net	1880	1930 EST	Mon., Wed., Fri.
Green Bay Emerg. Net	3950	0730 CST	Sun.
Hingham Mass. CD Club	28,600	2000 EST	Tue.
Indiana CW Net (QIN)	3656	1500 CST	Mon.-Sat.
		1730 CST	
		2100 CST	
Indiana Phone Net (IFN)	3910	1830 CST	Mon.-Fri.
Inland Empire Emerg. Phone Net	1995	1930 PST	Sun., Wed.

NATIONAL CALLING AND EMERGENCY FREQUENCIES

C. W.

'PHONE

3550 kc.	14,050 kc.	3875 kc.	14,225 kc.
7100 kc.	21,050 kc.	7250 kc.	21,400 kc.
28,100 kc.		29,640 kc.	

During periods of communications emergency these channels will be monitored for emergency traffic. At other times, these frequencies can be used as general calling frequencies to expedite general traffic movement between amateur stations. Emergency traffic has precedence. After contact has been made the frequency should be vacated immediately to accommodate other callers.

The following are the National Calling and Emergency Frequencies for Canada: c.w. — 3535, 7050, 14,060; 'phone — 3815, 14,160, 28,250 kc.

NATIONAL RTTY CALLING AND WORKING FREQUENCY

3620 kc.

This frequency is generally used by amateurs using radioteletype throughout the United States. Other frequencies are under discussion and will appear under this heading in future issues of QST.

Iowa 75 Meter Phone Net	3970	1230 CST	Mon.-Sat.
Iowa 160 Meter Net	1805	1830 CST	Daily
Iowa Tall Corn Net (TLCN)	3560	1845 CST	Mon.-Fri.
Iroquois Co. (Ill.) Radio Club Net	3920	1200 CST	Mon.-Fri.
Kankakee Co. (Ill.) Net	3920	1200 CST	Mon.-Sat.
Kans. 75 Meter Phone Net	3920	0800 CST	Sun.
		1230 CST	Tue., Fri.
		1845 CST	Thu.
Kans. Slow Speed Net (QRS-SS)	3610	1830 CST	Tue., Thu.
Kent (Mich.) Emerg. Group (KEGa)	146,160	2000 EST	Mon.
Kentucky Net (KYN)	3600	1900 CST	Mon.-Sat.
Labrador Net	3780	2030 GCT	Daily
Lake Erie Network	29,050	1315 EST	Sun.
Lakeland (N. J.) Emerg. Net	147,150	2100 EST	Mon.-Fri.
Livingston (N. J.) Radio Club Net	146,300	2030 EST	Mon.-Fri.
Los Angeles Section Net (LSN)	3600	2030 PST	Mon.-Sat.
Lucas Co. Ohio Emerg. Net	29,200	1030 EST	Sat.
Manitoba Phone Net	3760	1900 CST	Daily
Maritime Net	3750	1900 AST	Daily
Medina Co. (Ohio) Emerg. Net	1808	1300 EST	Sun.
Memphis Ten Meter Mobile Emerg. Net	29,627	1930 CST	Mon., Fri.
Memphis Two Meter AM Net	145,350	1930 CST	Fri.
Memphis Two Meter FM Net	145,360	1930 CST	Mon.
Mercer Emerg. Net (N. J.)	147,150	2100 EST	Sun.
Merrimack Co. (N. H.) Emerg. Net (MCEN)	28,600	1830 EST	Tue.
Mich. Emerg. Net (MEN)	3930	0900 EST	Sun.
Mich. QMN Net (QMN) *	3963	1800 EST	Mon.-Fri.
		1900 EST	
Minnesota Fone Net	3820	1205 CST	Mon.-Sat.
		1800 CST	
Minnesota Junior Net	3600	1709 CST	Mon.-Fri.
Minn. Section Net (MSN)	3595	1900 CST	Mon.-Fri.
Miss. CW Emerg. Net (MEN)	3795	1900 CST	Daily
Mo. Emerg. Phone Net	3900	1830 CST	Mon., Wed., Fri.
Mo. Valley Emerg. Net	28,850	2000 CST	Mon.
Mobile Amateur Radio Corps (Minn.)	29,590	1930 CST	Daily

(Continued on following page)

Monmouth Co. (N. J.) Emerg. Net	147,150	2130 EST	Mon.	Silverado Trail Net (Cal.) So. Car. CW Net (SCN)	145,800	2000 PST	Wed.
Montana State Net	3520	1900 MST	Sun., Tue., Thu.	So. Car. Mobile Roundup	3525	1900 EST	Mon.-Fri.
Morgan-Noble Net (Ohio)	3690	1200 EST	Wed.	So. Car. Phone Net	3930	1430 EST	Sun.
Morning Net (Conn.) (CN)	3840	1806 EST	Sun.	So. Cal. Teen Age Net	3930	1930 EST	Mon.-Fri.
Nehr. 75M Phone Net	3640	0945 EST	Daily	Springfield (Mo.) Area Net	7297	5 1900 PST	Mon.-Wed.
New Bedford (Mass.) Emerg. Net	3983	1230 CST	Daily	St. Paul Mobile Corps	3720	0800 CST	1/3 Sun.
New England 75 Meter Phone Net	29,400	0930 EST	Sun.	Sunrise Radio Club Net (N. Y.)	29,520	2000 CST	Thu.
N. H. Traffic Net (NHM)	3870	0900 EST	Sun.	Tar Heel Net (N.C.)	3950	1000 EST	Sun.
New Jersey Net (NJN)	3685	1900 EST	Mon.-Fri.	Teen Age Dragon Net	3885	1600 EST	Mon.-Fri.
N. J. 75 Meter Emerg. Phone Net	3695	1900 EST	Mon.-Sat.	Tenth Regional Net (TEN)	3515	1945 EST	Mon.-Fri.
N. M. 75 Meter Emerg. Phone Net*	3900	0900 EST	Sun.	Third Regional Net (3RN)	2130 EST		
NFC-LI CW Traffic Net (NLI)	3838	0730 MST	Sun.	Toronto Amateur 6 Meter Net (TASMEN)	3590	1945 EST	Mon.-Fri.
NYC-LI Phone Traffic Net	3630	1900 EST	Mon.-Sat.	Traffic Exchange Net (TXN)	51,060	1930 EST	Tue.
New York CD Net (RACES)	3970	1900 EST	Sun.	Transcontinental Relay Net (TCRN)*	7160	1900 CST	Daily
N. Y. State CW Net (NYS)*	3970	0900 EST	Sun.	Tri-County Net (TCN) (Cal.)	7942	2115 EST	Daily
N. Y. State Phone Emerg. & Traffic Net	3615	1900 EST	Mon.-Sat.	Tropical Phone Traffic Net (TPTN)*	0115 EST		
Newport (R. I.) Emerg. Net	3980	1800 EST	Daily	Trunk Line J (TLJ)	3820	1330 PST	Daily
N. Arlington CD Net (N. J.)	28,900	1000 EST	Sun.	Tuboro (N. Y.) Rag Chew Net	1900 PST		
N. Central Phone Net (NCN)	145,450	2000 EST	Wed.	Union Co. (N. J.) AREC Net	3945	1800 EST	Daily
North Fork Net (Okla.)	3915	0700 CST	Mon.-Sat.	VINET (V.I.)	3865	0730 AST	Daily
North West Texas Emerg. Net	3815	1215 CST	Mon.-Sat.			1230 AST	
Northwest Texas Emerg. Phone Net	3950	0800 CST	Sun.			1930 AST	
Northern Va. Emerg. Net (NVEN)	3970	0900 CST	Sun.			7205 0730 AST	Daily
Nutmeg Net (Conn.) (CN)	29,200	1330 EST	Sun.			1230 AST	
Ohio Emerg. Net	3640	1845 EST	Mon.-Sat.			1930 AST	
Ohio River Valley Emerg. Net	3860	1800 EST	Thu.			1930 AST	
160 Meter Screwball Net	3860	0900 EST	Sun.			1230 AST	
Ontario CD Net	1992	1230 CST	Mon.-Sat.			1930 AST	
	3765	1900 EST	Tue., Thu., Sat.			1930 AST	
Oregon Emerg. Net	3840	1900 PST	Daily			1930 AST	
		2000 PST				1930 AST	
Oregon Slow Net	3585	1830 PST	Mon.-Fri.			1930 AST	
Ottawa Co. (N. Y.) Net	29,600	2000 EST	Tue.			1930 AST	
Overseas Net	3970	0900 EST	Daily			1930 AST	
Pacific Area Net (PAN)	3670	2030 PST	Mon.-Fri.			1930 AST	
Palmetto Net (FN)*	3675	1905 EST	Mon.-Sat.			1930 AST	
Pine Tree Net (Me.) (PTN)	3596	1900 EST	Mon.-Fri.			1930 AST	
Post Road Emerg. Net	28,590	1900 EST	Mon.			1930 AST	
Princeton (N. J.) CD Net	29,325	1530 EST	Sun.			1930 AST	
Province of Quebec Net (PQN)	3570	1915 EST	Daily			1930 AST	
P. R. Amateur Emerg. Net	3559	2000 AST	Mon.			1930 AST	
	3925	2000 AST	Wed.			1930 AST	
Quarter Century Wireless Amon. Net	3810	1100 EST	Sun.			1930 AST	
Quincy Mass. Emerg. Net	28,620	1930 EST	Mon.			1930 AST	
	146,800	1030 EST	Sun.			1930 AST	
		1920 EST	Mon.			1930 AST	
Quincy Mass Sector 5 CD Net	28,590	2000 EST	Mon.			1930 AST	
Radio Amateur Club of Belleville, N. J., Net	29,600	0930 EST	Sun.			1930 AST	
Red Horse Net	147,240					1930 AST	
	1882	1330 CST	Mon., Wed., Fri.			1930 AST	
Red Jacket Mobile Net (N. Y.)	29,000	1000 EST	Sun.			1930 AST	
Rouau de Traffic de la Province de Quebec*	3740	1815 EST	Mon.-Sat.			1930 AST	
R. I. Traffic Net	3540	1900 EST	Mon.-Fri.			1930 AST	
RTTY Net (Calif.)	147,850	1930 PST	Tue.			1930 AST	
San Antonio Radio Club Emerg. Net	3855	1800 CST	Thu.			1930 AST	
San Bernardino Area Net	29,200	1100 PST	Mon., Wed., Fri.			1930 AST	
San Diego Co. AREC Net	3825	1000 EST	Sun.			1930 AST	
San Joaquin Valley Net (SJVN)	3525	1900 PST	Mon.-Fri.			1930 AST	
Santa Barbara Section Net (SBN)	3630	1930 PST	Mon.-Fri.			1930 AST	
SARO Net (Calif.)	3791	0900 PST	Sun.			1930 AST	
	3870	0930 PST	Sun.			1930 AST	
	29,600	2300 PST	Mon.			1930 AST	
Saskatchewan Net	3780	1845 MST	Daily			1930 AST	
Sea Gull Net (Me.)	3960	1730 EST	Mon.-Fri.			1930 AST	

CODE-PRACTICE STATIONS

The following schedules bring up-to-date the list of stations (p. 69, November QST) currently transmitting code practice in the ARRL Code-Practice Program. Please note the discontinuance of W4IYT's sessions:

W2EBS, Paul Reynolds, 63 Oswego St., Baldwinsville, N. Y.; 3/390 ke.; Mon., Wed. and Fri., 1030 EST; 5-13 w.p.m.

W2NRM, Howard B. Jack, Brown's Trailer Court, R.F.D. 6, Lodi, N. J.; 1.88 and 29.118 Mc.; Mon. through Fri., 2100 EST, Sat., 0800 EST; 3-8-15 w.p.m.

W8IJE, Calumet High Radio Club, Calumet, Michigan; 28.3 Mc.; Mon., 1930 EST; 5-10-15 w.p.m.

W0LQC, F. Bion McCurry, 1234 Stanford, Springfield, Missouri; 29.18 Mc.; Tues., 2130 CST; beginners' speeds.

BRIEF

Since publication of the 1952 Sweepstakes results, the following errors have been brought to our attention: In the tabulation of club scores, W9HCY should have been shown as the c.w. winner of the Chicago Suburban Radio Association. Also in the club listings, VE3BNF should have been identified as the c.w. winner of the Nottown Amateur Radio Club, W2LBM's c.w. score of 11,223 points in Eastern New York section was attributed erroneously to W2LHM. Likewise, we showed the call of W2IAW, who totaled 3025 points on 'phone in N.Y.C.-L.I. section, as W2AIW. To all concerned, we sincerely apologize for the slips.

TRAFFIC TOPICS

Amateur traffic that comes through without a complete preamble just isn't complete traffic. We don't care whether it was originated on 'phone or c.w., on a MARS circuit or in a foreign country, on v.h.f. or h.f. To most of us traffic men, it's a pain in the neck to try to handle traffic with an incomplete preamble. Let's do it right, fellows.

Two things have long been considered optional in message handling—the check count and the filing time. Personally, we like to see a correct check and an accurate filing time on each message, just for the sake of completeness. If we're going to handle traffic, let's do a good job of it. It might be worth while to go through the parts of a message, just to straighten out some minor points which, when added up, make the difference between an accurate, well-sent message and a slovenly, haphazardly-handled one.

1) *The number.* No trouble here. Every message should have a number, and we haven't heard a numberless message in a long time.

2) *Station of origin.* This is the station at which the message originated by radio, regardless of its actual place of origin or who originates it. If you take home a batch of messages from the state fair, your call appears as origin, not the call of the fair station. If WINJM finds he cannot get rid of a message he wants to originate and telephones it to WIBDL who can handle it, the station of origin is WIBDL, not WINJM.

3) *Check.* The originating station should determine the check (text word count) before originating the message. This includes the actual count of words and punctuation or punctuation substitutes in the text only. In general, one uses the dictionary as a guide, but right or wrong, the originator's check is sacred and inviolate. In handling the message in successive relays, the two handling stations may agree that the check is wrong and add a corrected check (e.g. CK 2324—on 'phone, say "slant" for /), but the originator's check should remain. If the originator does not use a check, it is perfectly correct for handling operators to do so.

4) *Place of Origin.* We don't know just what to do when messages originating in MARS circuits find their way into amateur channels without a place of origin. Probably the only thing to do is insert the clause "No place of origin," and then go on with the filing time, etc. The place of origin is the place the message was originated, not necessarily the location of the station of origin. If they are different, the station's location can be included in addition to (but not instead of) the actual place of origin. A message mailed or telephoned from New York City for origination by an amateur in Newark would have as its origin "NEW YORK NY VIA NEWARK N.J." The place of origin is primarily of interest to the addressee and should be entered with that in mind.

5) *Filing time.* We like the 24-hour system best because it can be expressed in four digits regardless of the hour. Date-time groups are gaining popularity (091907Z would mean 1907 Greenwich Time on the ninth of the month), but they're a little confusing to the uninitiated. The filing time is optional and often not used.

6) *Date.* Some operators give the date first, then the month (military style), others just omit the month. Generally speaking, neither the month nor the year is necessary—just give the date and you'll keep out of trouble. On 'phone, give the date as "November eleventh," not "eleven eleven fifty-three" as we've heard done so often. The latter is not even recognizable as a date to some people.

7) *Address.* Aren't these military addresses awful? On c.w., be sure to use the signal AA between the parts of the address, and on 'phone be sure to use phonetics as needed. The address is the hardest part of a message, most experienced traffic men will agree. Be careful in sending it.

8) *Text.* On c.w., start with a separator sign (BT); on 'phone, say "text." Avoid punctuation as such, spell it out if needed. There are a lot of military-derived punctuation substitutes floating around these days, particularly PD, meaning "period" and X, meaning either period or semi-colon. If used, they are counted in the check. Personally, we think on c.w. PD sounds too much like a loosely-sent "AND" and X might be mistaken for BT. What was the matter with "STOP"?

9) *Signature.* Before sending a signature, don't forget the BT separator signal on c.w., or to say "signed" or "signature" on 'phone. There is no longer such a thing as "extra" check, so no matter how long the signature it does not count

extra in the check. Complimentary closes to a message, such as "love," "best wishes," "regards" or what have you should logically be a part of the text, not the signature; however, if the originating station includes it as part of the signature, leave it that way, and don't count it as part of the check. If you use the BT sign at the end of the text it is not necessary, on c.w., to say "SIG." In fact, if the signature is "Ned" something, the receiving operator may get confused between "SIG NED" and "SIGNED."

10) *End of Message.* On 'phone, say the words after the signature. On c.w., send AR and follow this with an indication that there is more to follow (B) or that there is no more (N). This is most important, and a lot of operators neglect it. The AR tells the receiving operator that that's all, there is no more, stop copying. It is necessary, so let's use it. Otherwise, a receiving operator might copy a signature "GEORGE SMITH NM HW." How is he to know that the latter two groups are not part of the signature?

Most of the above and a lot more is in our booklet *Operating an Amateur Radio Station*. This costs twenty-five cents per copy, but in the interest of good traffic handling, we'll send anybody a copy free, for nothing, gratis, if you'll use it.

Newly-elected TCPN Chairman WSLMB announces W2BTE's publication of a booklet designed for distribution among TCPN net members. The information includes (Continued on following page)

BRASS POUNDERS LEAGUE

Winners of BPL Certificates for October traffic.

Call	Orig.	Recd.	Rel.	Del.	Total
W3CUL	243	2530	1803	693	5269
KA3AC	337	1210	1188	22	2757
W4USA	48	1108	1026	65	2247
K6FCA	37	968	912	48	1965
W5MN	67	911	644	263	1885
K6FCY	54	727	709	27	1508
K1WAR	252	616	566	50	1484
W6CPI	12	648	586	62	1308
KH6FAA	118	524	468	47	1157
K5FFB	40	489	518	19	1066
W0QXO	20	475	406	67	968
W5TFB	172	376	298	78	924
KH6AHQ	35	319	211	312	877
W6KYV	97	388	140	248	873
K6FCT	51	351	308	107	817
W8ZGT	43	353	340	50	786
W4PL	5	365	290	64	724
W9UJL	16	365	319	33	724
W9NZZ	170	290	1	257	688
K0FCR	101	290	273	5	639
W3USA	30	304	235	69	638
W0BDR	5	315	303	7	630
W7KT	5	311	304	5	625
KV4BD	118	210	97	181	606
W3WIQ	26	269	273	29	597
W4YIP	10	287	250	27	574
W7PGY	18	278	263	15	574
W7BA	13	267	257	10	547
W8CA	2	269	263	71	545
KH6AIF	56	238	184	54	532
W9VBZ	28	241	227	33	529
Late Reports:					
K6FCY (Sept.)	36	2610	2586	24	5256
W3WIQ (Sept.)	20	1307	1301	31	2659
K6FCY (Aug.)	36	977	960	17	1990
KA7RC (Sept.)	63	797	780	17	1657
K6FCY (July)	19	743	710	33	1505
W5TFB (Sept.)	17	362	300	2	621
W0BUR (Sept.)	2	272	271	1	546
W4WHC (Sept.)	497	17	4	9	527

BPL for 100 or more originations-plus-deliveries:

K5NRX...	232	W4DRD...	117	Late Report:
W1AW.....	187	W4DVR...	116	K4WBG (Sept.), 120
W5UVC....	132			

The BPL is open to all operators who report to their SCM a message total of 500 or more, or 100 or more originations-plus-deliveries for any calendar month.

A.R.R.L. ACTIVITIES CALENDAR

Jan. 8th: CP Qualifying Run — W6OWP
 Jan. 9th-10th: V.H.F. Sweepstakes
 Jan. 9th-24th: Novice Round-up
 Jan. 13th: CP Qualifying Run — WIAW
 Jan. 16th-17th: CD QSO Party (c.w.)
 Jan. 23rd-24th: CD QSO Party (phone)
 Feb. 6th: CP Qualifying Run — W6OWP
 Feb. 9th: Frequency Measuring Test
 Feb. 11th: CP Qualifying Run — WIAW
 Feb. 12th-14th: DX Competition (phone)
 Feb. 26th-28th: DX Competition (c.w.)
 Mar. 7th: CP Qualifying Run — W6OWP
 Mar. 12th: CP Qualifying Run — WIAW
 Mar. 12th-14th: DX Competition (phone)
 Mar. 26th-28th: DX Competition (c.w.)
 Apr. 2nd: CP Qualifying Run — W6OWP
 Apr. 10th-11th: CD QSO Party (c.w.)
 Apr. 12th: CP Qualifying Run — WIAW
 Apr. 17th-18th: CD QSO Party (phone)
 May 1st: CP Qualifying Run — W6OWP
 May 11th: CP Qualifying Run — WIAW

points and procedures to enable every participant to aid in the smoothest possible net operation. WISJO reports a traffic total of 2177 by 51 stations in 31 October sessions.

National Traffic System. We think the Pacific Area of NTS merits a bit of applause for the magnificent way in which it has pulled itself up by its bootstraps from the organizational doldrums into a highly efficient and active part of the National Traffic System. Much of the credit goes to the recently-organized Pacific Area Staff and its chairman, W6JZ. Ray's "gimmick" is to emphasize the once-per-week participation of all traffic men rather than to depend on the "iron men" of the traffic game. It is principally around these men, who either do not have the time or the inclination to handle traffic daily, that NTS was intended to be built. That this principle is workable is rapidly being proved by the active traffic organizers on the West Coast, who, at the present rate, soon will be giving the rest of the traffic fraternity something to shoot at.

October reports:

Net	Ses-	Traf-	Aver-	Most
	sions	fic	High	Consistent
IRN	22	349	35	15 8 Conn., E. Mass., N. H., W. Mass.
3RN	21	164	25	7 8 E. Pa., MDD
4RN	44	266	26	6 Va.
RN5	28*	132	19	4 7 La., Tenn.
RN6	47	353	23	7 5 BAN
8RN	16	72	20	4 5 Ohio
9RN	28	1006	169	35 9 Wis.
TEN	44	1018	49	23 1 Ia., Minn.
TRN	45	119	8	2 6 ONS
EAN	22	668	57	30 3 All
CAN	21**	491	65	23 3 All
PAN	21	571	63	27 1 RN7
Minn. Fone	45	116	59	2 6
TLCN (Ia.)	20	258	47	12 6
WSN (Wash.)	22	140	18	6 3
QIN (Ind.)	49	373	32	7 6
LSN (Los. A.)	16	132	35	6 9
Total	506	6228	169	12 3
Record	766	6313	169	12 3

* Out of 44 scheduled ** Out of 22 scheduled

The "records" noted above which differ from this month's totals were both made in October, 1952. Our NTS nets are conducting fewer sessions but handling more traffic per session. The original NTS structure is thus deteriorating due primarily to abandonment of the late session of regional and section nets because of unfavorable propagation conditions. Some regional nets have also adopted the "shuttle" system, under which section and regional nets are conducted simultaneously, a section net representative going to the regional net to clear "thru" traffic and bring back traffic for the section—or two different section men perform these duties if they are available.

Forty-two different stations participated in IRN during October, four sections achieving perfect attendance. W3ONB reports gratifying cooperation after his first month as 3RN manager. W1ANK is acting 4RN manager during W4AKC's temporary absence. W5MRK again reports for RN5 in the continued absence of W5QHI who, we understand, had a fire in his shack. W6IPW is training new operators for RN6, including his daughter, KN6HQV. VE3BUR reports things picking up on TRN but with the Maritimes represented only occasionally. W8SCW has issued another fine EAN Bulletin in which he points out that out of 195 sessions so far this year (1953), no regional net has been absent more than 23 times, with 1RN and 2RN missing only three each. The 4RN especially has shown a great improvement. W6ELQ has been awarded a PAN certificate. W7NH says traffic is slow during October, but points out that RN7 has had 100 per cent attendance for four consecutive months.

OCTOBER CD QSO PARTIES

Reported scores in both the c.w. and 'phone portions of the October CD QSO Parties indicate conclusively that there was no dearth of activity on the part of ARRL appointees! Figures following each call indicate final score, number of contacts and number of ARRL sections worked. Complete results will appear in the January CD Bulletin.

C.W.

W4KFC	161,660-541-59	W7CCC	63,360-160-44
W1AW ¹	121,000-433-55	W8NOH	63,215-264-47
W8NBR	109,080-397-54	W2IFP	62,370-291-42
W5RID	95,665-358-53	W4VHX	61,100-260-47
W3JTK	93,000-372-50	W4NH	58,500-260-45
W1EOB	82,350-298-54	W7GHT	55,470-140-43
W1ZDP	80,835-310-51	W3VKD	54,240-226-48
W6BIP	71,834-159-49	W7CMH	54,180-140-43
W1BZE	68,845-276-49	W6YHM	53,118-148-39
W1WPO	65,905-262-49	W1AQE	52,920-252-42
W3EEB	65,660-268-49	W4VHH	52,800-258-41
W4YIP	65,280-265-48	W1JYH	52,140-270-38
W1CRW	65,250-261-50	W1RAN/1	52,290-243-42
W3KUN	65,095-270-47	W3FOR	51,700-228-44
W7TCI	64,584-156-46	W2CWK	51,465-213-47
W1PNK	64,240-292-44	W2HWH	50,955-233-43

'PHONE

W4NYN	12,250-98-25	W8MGC	6,200-62-20
W1FV	11,040-87-24	W2ZW	5,880-49-21
W8NBR	10,250-75-25	W1JYH	5,190-55-18
W9KDV	7970-78-23	W4JUV	4840-47-18
W1LK	7810-71-22	W2WCL	4540-43-19
W2ZQ ²	7260-66-22	W8PBX	4410-49-18

¹ W1VMMW, opr.

² Four ops.



At the New York State ARRL Convention in Buffalo last October, Jeanne Walker, W2BTB, was presented with a plaque on behalf of TCPN for her traffic work for GIs overseas. WISJO made the presentation. (Photo by W2DXZ.)

Station Activities

• All operating amateurs are invited to report to the SCM on the first of each month, covering station activities for the preceding month. Radio club news is also desired by SCMs for inclusion in these columns. The addresses of all SCMs will be found on page 6.

ATLANTIC DIVISION

EASTERN PENNSYLVANIA—SCM, W. H. Wiand, WB1P—SEC: IGW, RM: AXA, PAM: WYF, E. Pa. Net; 3610, 3850 kc. A test of E. Pa. c.d. communications was called by the State C.D. Council for Oct. 6th at 7 p.m. QV's gear was used as radio center with the operating crew manning a 2-meter link and a 10-meter link with various control centers. This crew consisted of the following stations: BWQ, CXU, EDC, IOU, KKN, GRY, QVK, ULC, UZF, and UZL. Helped as control center for the State C.D. Net covering the E. Pa. counties while PJM, using c.w., stood by as alternate control center. The West Philadelphia control center was undamaged in this mock drill and linked Philadelphia to the rest of the State with the West Philadelphia RC manning this center under the direction of OWK. Philadelphia's c.d. communications truck, with PNR, DYL, and PST making up the crew, directed several missions involving mobile stations of the Phil-Mont RC, DYL, EC of Philadelphia County, reporting the above information says. "The general opinion was that the test was a success." The South Philadelphia Amateur Radio Klub (SPARK) recently acquired radio equipment in the form of receivers and transmitters from c.d. authorities. Eleven members of the Lancaster RTS, using 2-meter mobile gear, furnished communications for the Lancaster County Fire Police during an air-raid drill in Elizabethtown, Pa. Jan. Code classes were resumed by the LRTS, with UMX as instructor. Classes are being held in the McCaskey High School every Wednesday evening. New officers of the York ARC are STE, pres.; IXG, vice-pres.; RAF, secy.; UQJ, asst. secy.; EDO, treas.; QFM trustee. AEQ is back on the air from Lehigh University and is very active in PPN as well as in the College Net. OSA now is running a full gallon. HCT is very busy with his QZ'er. MLY, who is mobilizing on 75-meter phone, has reported into the East Able C.D. Net from seven states and D.C. NOI erected two 50-foot poles at his new QTH and again is active on 75 and 2 meters. Seasons Greetings to all from Yours Truly Traffic: W3CUL 5269, BFF 288, NOK 130, GES 94, BIP 90, AEQ 84, PDI 50, PYF 39, MLY 30, DUL 28, SHP 28, QIZ 26, KAG 18, PVY 18, VN 13, UOE 12, OZY 11, TEJ 11, ELI 9, BES 3, ROE 2. (Sept.) W3ELI 89, CHU 13, RSC 6, AD 4.

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA—SCM, Arthur W. Flummer, W3EQK—Your SCM would like to take this opportunity to express his gratitude to all the members of the section for the fine way in which monthly reports are beginning to come in. ONB, who is not even an OD, has been making some very accurate frequency test measurements lately. He makes a suggestion to me which seems interesting, so I am asking the secretaries of all clubs in the section to notify me as to their place, time, and dates of meeting. ECP says his new 10-meter vertical, erected to give better results with mobiles, really is paying off on both ends of the QSO. PZW expects to be on in Virginia as a W4 soon. WV, PZW's OM, is active in handling DX traffic as well as reporting into VN and MDD Net. CQB reports he will have a new 40-meter vertical up as soon as his pet tree sheds its leaves! USA has a new MARS director in the person of 1st Lt. James W. Stewart; 2nd Lt. Osterman is his assistant. Work is progressing on the new MARS station quarters. HKS reports e.w. activity on his part in the October CD Party. NPQ's night-work sked has him tied up for awhile. The U. of Md. Radio Club meets Wed. at 7:30 p.m. and all U. of Md. boys are invited to attend. EAX, vice-president, reports the Club recently had a lecture on "4PG's transmitter." LDD, Harford County E.C., reports success in organizing mobiles in the Havre de Grace-Aberdeen Area into an FB net. FQB reports 228 c.w. QSOs in 10 hours during the October QSO Party. CDQ was active from PZA during the recent S.E.T. The Washington Radio Club has voted to change meetings from the 1st and 3rd Fri. to the 2nd and 4th Sat. CDQ showed pictures she

took while on her recent European trip at the Oct. 24th meeting of the WRC and 9C8K spoke on s.s.b. operation at the Oct. 10th meeting. LDD, president of the Aberdeen Proving Ground Radio Club, also has been made CDRO for Harford County. The following are members, with those in italics operating mobile: WIRMN, WITEA, K2DIC, W3SMA, W3VLR, W4ONL, W3ZOG, W7UPW, W8MNH, W8CPN, and W0MZN. Orville reports things really are getting hot on 29,500 kc. up his way. MEJ has a new 40-ft. tower and JTC is putting one up also. AFR showed two very interesting color movies to the BARCS at the Nov. 2nd meeting, one being "Crystal Clear," a story of the manufacture of artificial crystals used in telephone repeater circuits, and the other "The Transistor." The fellows at ARA in Hagerstown ran off a tape of their activities during the last S.E.T. The Antietam Net will be in full swing before long on 3827 kc. Full members of the net must be members of ARA, associate members shall consist of those who are not members of ARA. CIQ, CSN, EHA, ONL, OYX, SCC, YAM, and W3AWTO used their talents to assist the Alsatia Club in regulating their Annual Numbers Parade in Hagerstown Oct. 28th after a practice run on Oct. 25th. CSN led the parade, YAM was stationed at formation point. ONL and CIQ took positions at strategic points along the line of march, while OYX, 3827 kc. and W3AWTO, operated from the judges' stand. PRL, our SEC, is enjoying a well-earned vacation in Mexico. MEPN now has 65 members. Greetings to a newcomer, VCN of Worton, Md. VUK's NYL is hot after her General Class ticket. RSV now is doing business in his new location on the Snow Hill Road. The Washington Mobile Club has 105 units and the Maryland Mobile Club has 65. Traffic: W3TSA 638, ONB 75, ECP 59, JE 40, CIK 29, JZY 24, PZW 24, WV 23, QCB 22, CQS 21, BWT ARB 17, HC 15, NOE 14, HKS 10, OYX 8, NPQ 7, EQK 4, LVJ 5.

SOUTHERN NEW JERSEY—SCM, Herbert C. Brooks, K2BG—SEC: UCV, PAM: ZI. A number of 10-meter stations in the Camden Area took part in the Philadelphia, Pa., civil defense drill on Oct. 6th. Those participating were LJE, QBH, WKI, ABQ, and SDP. DX is perking up on 20 meters, with ZNO and ASG working a few of the choice stations. ZI is doing a swell job with his new 32V-2. WUP now is mobile on 10 meters. Good luck, Walt. K2CPR, ex-W3BXE, former SCM of Eastern Pennsylvania, now is located in this section. Welcome, Jack. We hope that more fellows will interest themselves in the activities of the section and assist those now doing a good job in the AREC and RACES by adding their support. The Jersey-Penn 10-meter Net meets Sun. at 1100 hours. Those holding appointments in the section again are urged to report their activities, using Form 1. Traffic: W2RG 138, ZVW 52, ZI 29, K2BG 27, W2ASG 24, HAZ 2.

WESTERN NEW YORK—SCM, Edward G. Graf, W2SJY—Asst. SCM, Jennie Walker, 2BTB, SEC: UTH, RM: RUF, PAM: GNS. The NYSS meets on 3615 kc. at 7 p.m. and 3980 kc. at 6 p.m. the NYSS on 3595 kc. at 8 p.m.; NYS C.D. on 3509.5 and 3993 kc. at 9 a.m. Sun. Just before leaving for Korea, while attending the NYS Convention, ITBU/2, USAF, former operator at FAV, was presented a birthday cake by BTB and a miniature plane with wishes for a speedy and safe return. Appointments and renewals: BNC as ORS, QHL and UVE as EC, HXG and QYT as OO, HXG, VDF, and JMT as OPS. Section Net certificates have been issued to QRG, TEP, BZC, TAH, WER, ZOL, WXD, JXT, and BEO. K2CH moved to Rochester. QAA is back on the air after cleaning up on some Tennessee Indians. KKZ completed a phone patch to use with his Viking. EMW has a new bandswitching rig with 813 final. FMX, HAX, YLV, and FDD are making a noise on 420 Mc. The Oneida Hamfest was a great success, with the fine program arranged by RXW. VDF has HRO-5 receiver all-band VFO transmitter. The RARA held ARRL Nite with Director 3C2EC and ye SCM addressing the meeting. G2TA dropped in at the meeting and gave a very interesting talk on amateur conditions in England. The Tri-County ARC meets the 3rd Mon. of each month at the Broadbain Grade School. New officers are DWA, pres.; KWG, secy. Classes in code and theory are held with GAZ, RMD, and YJL as instructors. KN2EPV is the NYL of ZOC, and KN2LPW the NYL of GJG. SDE has 97-ft. tower and 1-kw. rig for 2 meters. BW and BEZ dropped the "N" from their calls. KN2EGD and K2BEZ are happy for a look-see. New editors of the Ft. Stanwix Area are HAX, pres.; RDB, vice-pres.; MSM, secy.; TCI, treas. HAX is conducting code classes. SDX is Radio Officer for Rome and JNM for Oneida County. RDB, with the help of IXR, H8X, MSM, JHK, AQP, and K2CNI, instructed 40 who qualified for restricted permits. EC HXG reports 5 stations in the S.E.T.,

3 mobile and 2 fixed. The Corning ARA conducted a hidden transmitter hunt, with EUQ winner of mobiles. QLI has built a portable rig. EWP is back on the air from Washington, D. C. CPN had as his guests OZSAG and INW. ZHU is busy installing vertical 2-meter antennas throughout the county for e.d. activities. RQF raised the antenna. ORI addressed the Rochester v.h.f. group on "Front End Noise." 420 Mc. ORI and IHDQ hold regular QSOs on 2 meters. The RDXA had as guest speakers INW, 9RQC, and GZTA. TEX works DL4CR to chat with his son. BGO attended the Erie County C.D. Test. Traffic: (Oct.) W2RUF 330, HKA 76, JMT 70, COU 62, OE 60, KEL 59, IPC 47, BUC 47, DSS 38, EMW 37, SJV 27, WER 22, K2DCG 20, BUI 17, W2CPN 14, HXG 10, FGL 8, RQF 4. (Sept.) W2RUF 74, EMW 51, MSE 15, FGL 10.

WESTERN PENNSYLVANIA — SCM, R. M. Heck, W8NCD — SEC: CA. PAM: LXE/VKID, AER, RM: GEG, NUG, UHN. Present officers of the ATA are OVM, pres.; UL, treas.; TRZ, secy.; NUG, SIR, RSB, and AJU, directors. MCRA EC, CJE, says the S.E.T. activity was well attended. MCRA's new officers are GEG, pres., CJE vice-pres., SYZ, treas., KQN, secy., MWV, executive board member. New officers of the SCARC are NRQ, pres.; LOR, vice-pres.; SVJ, secy.; VBL, corr. secy.; RIK, treas. W3UCH now is W3UHL. UUG is very busy as secretary-treasurer of the YLRL. INJM, NEC, was the principal speaker at a meeting held in Pittsburgh Sept. 21st. All phases of the e.d. and AREC plans were fully discussed and the Pittsburgh Area S.E.T. e.d. drill plans were disclosed. The drill was reported to have been greatly successful, covering the entire Western Pennsylvania section. PIX has a new jr. operator. NCJ recently acquired an Extra Class ticket and DXCC and says his nephew, OGI, is active from his new home. TMK is working 2 and 6 meters with few finals. NKK and PDS demonstrated the potentialities of amateur radio to the Lawrence Park PTA and are receiving requests to repeat at other PTA gatherings. UQJ joins the Generals' Class men. New amateurs in Erie are WNS WSO and WAY. Working the Simulated Air Raid Alert in October were Erie hams OIE, RLJ, KVB, DXN, LKJ, ODF, OHL, POS, QN, MS, PJJ, NKK, MED, STK, PSL, and QPP. SME, a student operator of State College station YA, says they have a new emergency power unit and are active on 20, 40, and 80-meter c.w. 75-meter phone, and in traffic. MARS and e.d. work. PYF, mgr. of PEN, reports QPK, VKD/LXE, LXQ, and TSY are Western Pennsylvania representatives. Welcome to the Iyaside Amateur Radio Club at the Altoona Center of the Pennsylvania State College at Altoona. PA. Officers are POP, pres.; UZN, secy.-treas.; WYX, trustee. The club station is WYX. IDO, of the Washington County Amateur Radio Club, sends the club bulletin from which we note that W8UTN/3 has passed his General Class exam. TON is working with Uncle Sam, and UFI is working 14 Mc. and picking up some G and EA DX. The WCN now is registered with the ARRL and is working regularly Sun. on 3700 kc. at 2000 EST. The W. Pa. Emergency Network is sponsoring a Ten-Meter Ground Wave DX Contest Sat., Jan. 9th, 10:00 P.M. to 2 A.M. EST, open to amateurs within 125 miles of Pittsburgh. Double points will be given for mobile contacts. Write W3WJF, Box 651, Canonsburg, Pa., for zone details and send him your log and score. Traffic: (Oct.) W3WJF 597, LXQ 90, KUN 53, GEG 51, UHN 51, NRE 50, TSY 50, NCD 37, NUG 26, CA 17, AER 16, VKD/LXE 16, KNQ 13, SJJ 8, AEF 5, LSS 4, NCJ 4, MIZ 3. (Sept.) W3WJF 2659, QPK 242.

CENTRAL DIVISION

ILLINOIS — Acting SCM, George T. Schreiber, W9YIX — Section nets: IEN (phone) 3940 kc.; IEN (c.w.) 3515 kc. SEC: QIZ. Asst. SEC: HPG. PAM: QUT, RM: BUK. The Watchdog Net (WDN) — 7.45 P.M., 145.692 Mc.) has been meeting seven days a week, writes USL, and is handling plenty of traffic. The net has been feeding out-of-state traffic to IEN and IEN and taking Chicago Area traffic in return. KCW is Net Mgr. LRV soon will be sporting a new 20-meter beam with the help and advice of DO. Loop transmitting antennas are the interest of ROE, who puts 1.9 watts into his present four-by-eight-foot loop on his back porch. He works the East Coast. The Illinois State Police station at Chicago (KSB47) is 100 per cent ham operated. The operators are HJP, supervisor, ABS, CGP, EDH, PHI, PDH, OVI, and ZIZ. CFE and YIX are auxiliary operators. Not even Collins claims that its receiver is a frequency meter but 60 CW/9 managed 2.7 cycles per million in the September Frequency Measuring Test with his. KHJ is about ready to hit the air with new 400-watt all-band job. OAL is back on the air (75-meter phone) with a tree-supported wire after his 60-foot stick blew down. PGW built a new mobile which his friends say puts commercial gear to shame. YMI has a new Viking II, which he lovingly calls his Norwegian Collins. ERO moved to W6-Land and is getting ready to return to the air. PIR has needed 20-meter beam. CKU brought a new 32V-2 and then acutely tuned his receiver off 40-meter c.w. He found other hams operating on phone and now he speaks. Imagine! YLU got an OK from the XYL and is back on the air from Skokie, giving JGL some competition. Incidentally JGL is talking about eliminating the boxes he uses for chairs and doing

away with dangling wires in the shack. NN, who boasts his signal skips over the United States, was heard slumming the other day and working a W6 on 80-meter c.w. GDI and his brother, IL, still are chasing rare ones. What one misses the other grabs. WEA has taken his specially-designed electronic keyer off the air. He is missed on 40 meters. DFY plans a five-element vertical for 40 meters and offers to accept traffic for Mars, Saturn, and Jupiter. SME, VHD, VER, and RXL are new ILEN members and are working for ORS certificates. So is LMC. TGY/9 operated at the York High School Halloween Party, with TGY, UKW, WQL, OIL, and Novice ZMX taking their turns putting out 111 messages. They cleared their traffic through OKQ and IEN and ILEN. The club has a BC-348, DUA, the Red Cross station in Evanston, has new commercial verticals for monitoring 29.640 and 147.5 Mc. The local R. I. put out of business a bootlegger who pirated the call of HHA. KLB, 2-meter f.m. leader, has moved from the South Side of Chicago to a silk-stocking location on the North Side. JBH received a plaque of appreciation from the Associated Police Communications Officers at a recent Detroit Convention. BHQ still is overboard with CAP rigs at office, home, and mobile. CNN donated a tower to the Franklin Park e.d. group and now is marine mobile in Florida with his floating electronic lab. QBH is fighting the battle of the books at Purdue. He talks to his Dad, ECA, daily on 75 meters. ECA is of old Taylor tube fame. EQC booms into Chicago daily from North Aurora via 2-meter a.m. EVA runs perfect tape at the low end of 40 meters. More c.w. stations, especially down State, are needed on ILEN. Get in touch with BUK, Route Manager. Please send your reports and news items by the 6th of the month. Traffic: W900K 296, TGY/9 111, YIX 100, CTZ 71, CEE 46, W6CIW 9.41, W9VIT 41, BUK 37, LMC 31, DO 22, STZ 19, PPA 13, MRQ 12, SME 8, PPO 7, USI 6.

INDIANA — SCM, George H. Graue, W9BKK — SEC: IZL. Section Net: IEN, 3910 kc. QIN and BEF, 3650 kc. REC: TT, RM: JBQ, JUJ, WWT, QJW, and YWE. YWE is now Net Mgr. of QIN. PAMS: DOK, NTA. NTA is Net Mgr. of IEN. Newly-elected officers of the Indiana Radio Club Council are KDV, pres.; CMT, vice-pres.; DUD, secy.; DKP, treas.; MVZ, IFR, CHV, and NTA, dir. The Council met at Wabash, Oct. 1th. NYK is FWCR president. The DARA has a code class of 40. YUE has new 32V-3 and NC-18D. WEA now is a resident of Muncie. ART is mobile with a Viking. NH has a new antenna system. The 7-Mc. RFM Net will continue 8 a.m. sessions the first Sun. of each month. The IEN Net meets a half hour earlier, 6:00 P.M.; also meets at 9:00 A.M. daily for those who work a night shift. STC is a new MARS member. The Kokomo Club also has a code class. ERB meets with several nets for Indiana traffic. DJH, an Old Old-timer still is an active traffic handler. VNE recently graduated from the Novice ranks. IFR was host station to the IRCC met at Wabash. AVO was 122 cy. off in the recent Frequency Measuring Test. SWM is in the Naval Reserve. NZZ received WAVE award. JUJ has new antennas up 22 50-ft steel towers. VNV now is 75-meter mobile. LDI is on 2-meter f.m. KVE won the Tri-State Amateur Radio Society's 29-Mc. hidden transmitter hunt. The FWCR 29-Mc. mobile group furnished additional coverage for the Sheriff Dept. in Allen Co. during Halloween week. Assisting were EC EOG, LXI, PGG, DMC, CLZ, and BKJ as NCS, and mobiles LDI, NAH, EOG, CLE, TDU, BRW, NYK, JJI, CNL, KFS, CLZ, APW, PMA, GPL, and KNT. NTR has a code class of 30. DFW is new in Jeffersonville. QYS has a new skywire. JBQ has a 210 ft. QOR changed to a pair of 740s. NTQ is working 20-meter DX with a Harvey Wells. VZF boosted power to 500 watts. NTA reports a traffic total for IEN of 102. JBJ reports a total traffic for IEN of 48. Traffic: (Oct.) W9JUF 724, NZZ 688, YWE 318, JBQ 253, ERB 198, SWM 189, TG 136, TT 130, UQP 93, QYQ 74, NTA 59, STC 53, AB 49, OLN 49, DJH 48, VNV 34, WBA 30, FYM 24, RBX 23, IFR 19, CMT 17, BD 12, NTR 12, DKR 11, KDV 11, DOK 10, VNE 9, DGA 3. (Sept.) W9BKK 83, SWH 11.

WISCONSIN — SCM, Reno W. Goetsch, W9RQM — SEC: OYO. PAM: EST, RM: MQV, UNJ. Nets: (WIN) 3625 kc., 7 P.M. daily; (BEN) 3950 kc., 6 P.M. daily. State Mobile and e.d. frequency: 29.620 kc. Net certificates (BEN) have been issued to HHD, OPH, and NTD. SAA is NCS on TCPN. UTV is working WIN with 16 watts and an HRO-50T. The Point Radio Amateur Club elected new officers: VVX, pres.; N8S, vice-pres.; W9ZHH, secy.-treas. VEC has a Viking transmitter and HRO-50 receiver. VVX, BCF, and CLZ have gone mobile. KVK's new 20-meter beam was a casualty in a recent windstorm. UTV, UNJ, RTP, and SAA were issued net certificates (WIN). KQB has a new Sonar SRT-120-P. The Mancorad Club has a net session Sun. at 10 A.M. on 3960 kc. QNO is working DX with Viking transmitter. Active on 4-Mc. phone are HPC, BKB, BZL, and RKT. ZJW is new on all bands with a Heath rig. JAW and FMH have new mobiles. RYV has taken the s.b. TRG is chief operator of the Mancorad Club. RGI has worked 42 states plus 4 other countries with his Bandmaster from Cameron. VCH is attending Milwaukee School of Engineering and reports that the club station, HHX, needs a QSL from Wyoming for WAS. FUS has been taking a post graduate course at the U. of Minn. VKR re-

(Continued on page 76)

88

ONE of the first characteristics that an amateur looks for in a receiver is a stable high frequency oscillator. This is only natural, since an unstable oscillator circuit can mean the difference between a 100% QSO and losing a signal in a crowded band.

Let's take a look at the high frequency oscillator circuit used in the NC-88. It is of the tuned plate, untuned grid type, such as was used in the National NC-240-D, the stability of which is well known, and praised by many amateurs. In addition, a separate oscillator tube is used to insure adequate isolation from the mixer circuit. Circuit design also takes into consideration hum modulation, which is minimized by putting the cathode at ground potential.

After running drift checks it was found that the tuning condenser had a low positive temperature coefficient causing a positive drift on the 10 meter band. This was overcome by an ingenious method of winding the coil that includes the 10 meter range so that it has a slight negative temperature coefficient. In this manner, warm-up drift is held to a very reasonable figure.

Drift caused by poor voltage regulation in the 110 volt supply circuit is taken care of by this type of oscillator circuit which tends to self compensate for such variations. This is because changes in tube interelectrode capacities have relatively little effect on this type of circuit, due to the design and coupling of the coils.

In short, the stability of the NC-88 and freedom from drift caused by the many factors affecting such stability approach that of much higher priced receivers which have separate voltage and current compensation in the oscillator circuit.

Additionally, the NC-88 provides calibrated bandspread which, at its modest price, is an innovation. Its famous predecessor, the NC-57 did not have calibrated bandspread, and had one less tube in its actual operating circuitry.

All in all, it's a whale of a buy for the money. It may appear smaller than some of the competitive receivers, but it has more in it. Look it over, try it out before purchasing any low or medium priced receiver. You'll be glad you did.

HARRY PAUL, WIPMS



Sooner or later you'll want



KW-1 Transmitter—This kilowatt rig operates on phone or CW in the 160, 80, 40, 20, 15, 11, and 10 meter bands but tunes as easily as a 32V-3. Just pick your band, set the built-in VFO to the desired spot, and adjust the final amplifier for 1000 watts input. That's all there is to it! The KW-1 design reduces spurious radiation to a very low value, particularly at television frequencies.



35C-2 Low-Pass RF Filter — Although designed as an accessory for the 32V-3 and as standard equipment in the KW-1, coaxial fittings make the 35C-2 readily adaptable to any amateur transmitter having 52 ohm output. It has an insertion loss of only 0.25 db at frequencies below 30 mc, but its three individually shielded filter sections provide about 75 db attenuation at television frequencies.

See your authorized

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Ack Radio Supply Co.
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ARIZONA

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Radio Parts of Arizona
214 S. 11th St.
TUCSON
Elliot Electronics, Inc.
Box 5081
418 N. Fourth Ave.

ARKANSAS

LITTLE ROCK
Carlton Wholesale Radio

ARKANSAS-TEXAS

TEXARKANA
Lavender Radio Supply
Co., Inc.
520 E. Fourth St.
P. O. Box 596

CALIFORNIA

BURBANK
Valley Electronic Supply
1402 W. Magnolia Blvd.
LONG BEACH
Scott Radio Supply
266 Alamitos Ave.
LOS ANGELES
Henry Radio
11240 W. Olympic Blvd.
Kierulff & Co.
820-830 W. Olympic Blvd.
Radio Products Sales, Inc.
1501 S. Hill St.

OAKLAND

Elmar Electronics
140 — 11th St. at Madison

SAN DIEGO

Western Radio & TV
Supply Co.
1415 India St.

SAN FRANCISCO

San Francisco Radio &
Supply Co.
1282-1284 Market St.

COLORADO

DENVER
Radio Products Sales Co.
1237 Sixteenth St.

CONNECTICUT

NEW HAVEN
Dale Electronic Dist.
150 James St.

DELAWARE

WILMINGTON
Radio Electric Service Co.
of Pa., Inc.
S.E. Corner Third &
Tatnall Sts.
Wilmington Electrical
Spec. Co., Inc.
405 Delaware Ave.

DISTRICT OF COLUMBIA

WASHINGTON
Electronic Wholesalers, Inc.
2345 Sherman Ave., N.W.

FLORIDA

JACKSONVILLE
Kinkade Radio Supply
1402 Laura St.

MIAMI

Electronic Supply Co.
61 N.E. 9th St.
Walden Radio &
Appliance Co.
1809 N.E. 2nd Ave.

TAMPA

Kinkade Radio Supply
1707 Grand Central

GEORGIA

ATLANTA
Specialty Distributing Co.
425 Peachtree St., N.E.

AUGUSTA

Specialty Distributing Co.
644 Reynolds St.

SAVANNAH

Specialty Dist. Co.
411 E. Broughton St.

ILLINOIS

CHICAGO
Allied Radio Corp.
100 N. Western Ave.
Newark Electric Co.
223 W. Madison St.
PEORIA
Klaus Radio & Electric Co.
707 Main St.

ROCK ISLAND

Tri-City Radio Supply Co.
1919 Fourth Ave.

INDIANA

FT. WAYNE
Ft. Wayne Electronics
Supply, Inc.
223 E. Main St.

INDIANAPOLIS

Graham Electronic
Supply, Inc.
102 S. Pennsylvania St.

LAFAYETTE

Lafayette Radio Supply, Inc.
627 Main St.

MUNCIE

Muncie Electronics
Supply, Inc.
305 N. Madison

SOUTH BEND

Radio Distributing Co.
432 Carroll St.

IOWA

COUNCIL BLUFFS
World Radio Laboratories,
Inc.
3415-27 W. Broadway

DES MOINES

Radio Trade Supply Co.
1224 Grand Ave.

KANSAS

TOPEKA
The Overton Electric Co.,
Inc.
522 Jackson St.

KENTUCKY

LEXINGTON
Radio Equipment Co.
480 Skain Ave.

LOUISVILLE

Universal Radio Supply
Co., Inc.
533 S. Seventh St.

LOUISIANA

NEW ORLEANS
Radio Parts, Inc.
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MARYLAND

BAITIMORE
Kann-Ellert Electronics, Inc.
9 South Howard St.

MASSACHUSETTS

BOSTON
DeMambo Radio Supply,
Inc.
1095 Commonwealth Ave.
Radio Shack Corp.
167 Washington St.

MICHIGAN

DETROIT
M. N. Duffy & Co.
2040 Grand River Ave., W.

MISSOURI

BUTLER
Henry Radio Co.
211 North Main
KANSAS CITY
Radiolab
1612 Grand Ave.
ST. LOUIS
Walter Ashe Radio Co.
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MINNESOTA

DULUTH
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Northwest Radio
123 E. First St.

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141-147 W. Seventh St.
Hall Electric Co.
566 N. Robert St.

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75A-3 Receiver — The 75A-3 is a double conversion superhetrodyne designed for top performance in the 160, 80, 40, 20, 15, 11, and 10 meter amateur bands. A crystal controlled high-frequency oscillator and highly stable low frequency VFO permit accurate calibration of two kilocycles per dial division on 10 and 11 meters and one kilocycle per dial division on all other bands. The Collins mechanical filter gives the 75A-3 the most nearly optimum selectivity ever achieved in a communications receiver.



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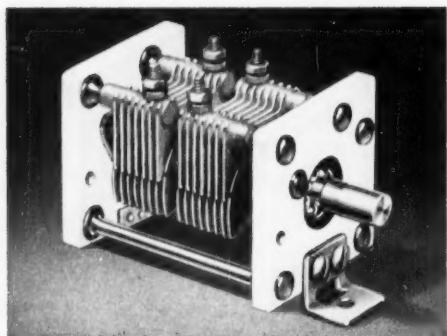
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As a result, the Hammarlund VU's are ideal capacitors for incorporating in either your fixed station or mobile amateur equipment. Try them in your next rig.

For detailed information on the VU and all other standard Hammarlund Capacitors write to The Hammarlund Manufacturing Co., Inc., 460 W. 34th St., New York 1, N. Y. Ask for Bulletin C2.



HAMMARLUND

(Continued from page 78)

ceived CAA award for Antarctica QSO. Orchids to MQV for a swell job on the first issue of the WIN bulletin. WIN NCs are lined up as follows: Mon.-MQV, Tue.-LGR, Wed.-ERW, Thurs.-UNJ, Fri.-RTP, Sat.-MQV or UNJ, Sun.-LSK. PVH is in W6-Land with the Marine Corps. MCY burned out his mod. transformer. CXY has a new vertical antenna. UIM enjoys flexibility of operation with the new Johnson VFO. The LaCrosse AREC provided mobile communication for search parties in the Hartley invader and with AKY, HJV, TXS, LKL, NOG, VRI, ADW, TCW, EZD, and SFL participating. LEE built a diode noise generator. OVO has a new Elnac mobile receiver. ZJA, ZIX, and VGL are building sixteen element 2-meter beams. GJK has TVI troubles. The U.H.F.-V.H.F. Forum sponsored by the N.E.W. VHF Club was attended by 110. AEE is building a complete new station. TKZ is enjoying new mobile. Traffic: W9VWZ 529, CXY 179, MQV 156, ESI 143, UNJ 65, SAA 64, GMY 61, IF8 21, PHB 16, SFL 16, CTV 16, CFP 14, IXA 12, RQM 10, KWJ 8, ERW 5, OVO 2, MUM 1.

DAKOTA DIVISION

SOUTH DAKOTA—SCM, J. W. Sikorski, W0RRN—Asst. SCMs: Earl Shirley, 0YQR, and Martha Shirley, 0ZWL. SEC: GCP, RM, OLB, PAMs, NJQ and CNY. GCP has not failed to send in a monthly SEC report since he took over the appointment in February, 1952. South Dakota now has 87 AREC members. PHR, OOL, BLZ, OOL, and RRN attended the Midwest Division Convention. The Prairie Dog ARC, Vermillion, is holding twice-a-week code and theory classes. New calls at Vermillion are WN8K RGH and RGN, GZE, formerly of Burbank, now is employed at Coeur D'Alene, Idaho. His XYL received the call WN8ONZ, and the harmonies became OOB and OOI before leaving South Dakota. RNA is running a ham class. ALU is home from service. 2LDN, manager of Duke Ellington's orchestra, operated mobile at Mitchell during Corn Palace Week. 9GEU visited his parents in Mitchell. The Black Hills ARC assisted police with 9 mobiles on Halloween. New calls at Ellsworth AFB are WN0s PTN and RH and 00QPC. PAX has a new 50-foot antenna pole. Traffic: K0FCR 639, W0OLB 100, 0JQ 65, PHR 57, NEO 44, GDE 17, QEK 15, ZWL 15, QPC 6, SMV 6.

MINNESOTA—SCM, Charles M. Bove, W0MXC—Asst. SCM, Vince Smythe, 00GQ. SEC: ZDU, RMs: OMC, DGL, PAMs: JIE, UCY, HBE and KJZ have been appointed ORS. FEZ has a new baby girl. 9LEE and 00BN are looking for contacts on 145 Mc. You 2-meter fellows can get together on the half hour and on the hour in the evening. QNF and QXA are twin YLs. They both hold General Class licenses and both hold Commercial tickets. The Twin City Radio Teletype Club meets on the first Mon. of each month at 7:30 P.M. at the home of BP. GYH and ITQ attended the Midwest Division Convention at Lincoln, Neb. UMD changed his QTH and is back on the air with a Titled 813. DL4AY now is on duty at Offutt Air Force Base at Omaha, Neb. TKX put on a transmitter demonstration using the new Transistors. Signal coverage was about ten miles. The Forrest Bryant-Minneapolis Radio Club trophy award has been extended to cover all amateurs in the State of Minnesota. If you know of any amateur who has contributed outstanding service to amateur radio, just write a letter about his achievements to the Minneapolis Radio Club, Inc. in care of ATT. The gold trophy would look swell in any ham shack. WQM now is operating full break-in and push to talk. Bob also built a dandy monotone unit. SZJ now is on c.w. and job me using a 457 as a mobile rig. Traffic: W0DQL 137, OMC 113, UCY 102, DYD 60, HUX 57, KFN 36, TKX 28, BZG 24, TJA 22, BUD 19, GTX 17, KLG 17, AGD 16, EMH 12, IKJ 12, KNR 10, OPA 9, IRI 8, FFU 7, FYT 7, HBE 7, IRF 7, GXD 6.

DELTA DIVISION

ARKANSAS—SCM, Fred Ward, W5LUX—The S.E.T. was a big success, with the Little Rock Club doing a wonderful job. Twenty-one stations participated and State Civil Defense and Red Cross officials attended. The Little Rock Club has a bus almost completely equipped with radio gear that will be available for use anywhere in the State and will probably see lots of service. VVI and WVD have new General Class tickets. The Union County Amateur Radio Club has a new club station call, B0JK. SXM is the new EC for Russellville. AS9 and PX have renewed their EC appointments. YHV has a rig set up at Hendrix College and is taking traffic for the Conway Area. MSH has a new ORS appointment and is working the nets regularly. We could use more traffic-handlers. Just ask RWJ for a job. Traffic: W5EA 18, PX 2.

LOUISIANA—SCM, Robert E. Barr, W5GHE—SEC: IUG, Asst. SEC: AVO, PAM, CEW, RM, NG, OO, Class E. F4R, MNT has been off the air with rig trouble. In his absence, ZLR has been passing the local and state traffic for the Hit and Bounce and the Crawfish Nets. NG visited in Cleveland, Ohio, recently, and while there made personal contact with an old radio friend of the Hit and Bounce network, 8DAE. SAY was up from Venezuela visit-

(Continued on page 78)

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HAMMARLUND

ng friends and relatives in Baton Rouge, FMO makes good records on the Frequency Measuring Tests, and his offer to check your frequency still holds good at any time. CEW is nearing the 200 mark in confirmed countries. Look out Vines, KC. Traffic: W5NG 273, TRQ 8.

MISSISSIPPI — SCM, Dr. A. R. Cortese, W5OTD — We finally have a c.w. net going here in Mississippi. MEN operates on 3795 kc. at 7 p.m. every evening. The Gulfport High School Club has 22 members this year. TIR has a new Windom antenna and is active in the 'phone and c.w. nets. TFC, CUU, HGL, and BEV are on a.s.b. AMZ is doing a nice job as NC on the MEN C.W. Net. KHB is doing OK with the Magnolia 'Phone Net. Some of you guys help AHA out with his TVI and BCL. CFI, TWE, and WQQ are working 20-meter c.w. and 'phone and SCM is building a 20-meter beam. Anyone want to help him? WNSBSL needs his receiver worked on. OTD is mobile on 10, 20, and 75 meters. The Jackson Club is working on a club transmitter and has acquired a receiver. There's lots of traffic, lots of rebounding, and lots of hamming being done these winter months. Let's keep the reports coming in. I like it. Traffic: W5JHS 179, RIM 66, TIR 66, KYC 50, VME 11, AMZ 5, OTD 3.

KENTNESSEE — SCM, Mark M. Bowelle, W4CXY/ W4I — SEC: NJE, RM: SCF, RAM, QT. State net frequencies: Traffic 3990, c.w. 3635 kc. PL made BPL (as usual) even though he took time out for a vacation. YIP also was out of town for some time but still made BPL. IWV (Tim and Helen) have moved the shack into new quarters and are set for some heavy traffic work. AKJ is also planning to move his rig to new quarters. SJ moved to a new QTH and is using the TV antenna, pending erection of his sky hook. UWA is going to school in Tennessee but still is acting as NCS on the Kentucky Net. WKS has his new rig on the air and now is working on a super-duper antenna. ZJY is in and out with his transmitter. PVD has been working some nice DX and is half way to his DXCC. He also reports formation of a Cookeville Net on 3735 kc. The Bays Mountain Club station, ZJA (Kingsport), is lining up operators for an active traffic season. AEE, State Radio Officer, reports that the Weakley County RACGS Net has been approved. This is the second plan to be approved in the whole southeastern area. FLW is to be congratulated. Traffic: W4PL 724, YIP 574, APC 315, VUA 167, ACP 142, IWV 128, OFZ 101, UWA 101, HB 84, OGG 83, PGP 69, VFL 54, SJ 28, DTI 13, ATW 12, ZJY 12, AKJ 10, RHO 10, RMJ 10, WGJ 7, RET 6, PVD 3.

GREAT LAKES DIVISION

KENTUCKY — SCM, Ivan C. Kelly, W4TUT — JUI has gone all out with new 90-ft. vertical and Collins 32V-3. WHC missed BPL for the first time this year. He is at a new post for two months. KKG is strictly working DX with new 20-meter beam. BRY is giving 80 meters a work-out with 30 watts. ZLK is a new ORS at Tompkinsville. SKE really is keeping in touch with the gang. Dick is operating from the police ward of a New Jersey hospital. ABE needs more time for amateur radio. URF now is working in Charleston, W. Va., as electrical engineer. Get her on the air. Bill. K4WBG now is mostly on 20 and 40 meters. WAO handled a lot of traffic from the Scout Exposition. WNH still is trying to calm a nervous VFO. JUI built a new frequency standard and had 0.7 cycle variation in one month. BAZ is working all bands 2 to 160 meters. TUT was not too active while getting himself elected Mayor of Somerset. The gang at Owensboro is forming a radio club. Traffic: (Oct.) K4WBG 313, W4BAZ 128, WHC 71, WAO 65, ZLK 21, WXL 20, WNH 15, QJH 8, AHL 2. (Sept.) W4WHC 527, K4WBG 208, W4BAZ 77.

MICHIGAN — SCM, Fabian T. McAllister, W8HKT — Asst. SCMs: Bob Cooper 8AQ4; Joe Beljan 8SCW. EC: GJH. New officers of the Grand Rapids Club are DLZ, pres.; GJH, vice-pres.; and ZCH, treas. The South Quadrangle Club at the U. of M. now has 20 members, with a class for beginners. They sparked the Michigan College Net, which operates on Saturday nights. With skip conditions picking up, some of the out-state high-power nets are raising hob with our nets; it looks like we will have to all bear down a bit and make sure we are on a spot frequency. After a busy summer ZGT is back in there pitching. There's lots of over-uss traffic coming this way and Ld has been getting rid of her share. NUL also has taken advantage of it, with fine results. IQJ is using a new Matchbox antenna tuner and new HQ-140X receiver, and says they sure make a difference. NXQ and KBI are both proud papas of new daughters. WVL has been pheasant hunting with good results. SCS has joined the vertical antenna crowd, and is working on a 160-meter job! The Ingham County EC Net holds drills on 40 meters every Thurs. night. The Rifle Club boys had a workout on Oct. 24th, with stations in Detroit, Pontiac, Flint, and Grand Rapids reporting scores for the individual shooters. NEJ/NEK is a cooperative OM/XYL station in the U.P. John reports they are six miles out of Seney; no BCL, no TVI (no TV), no line noises, and plenty of 90-foot pine trees for maats. By the time this is in print one of our State Fair stations will have a pile of traffic for us. Whether we like it or not, fellows, any traffic which is considered legitimate by the accepting (originating) station and placed on the nets is traffic which we are morally bound

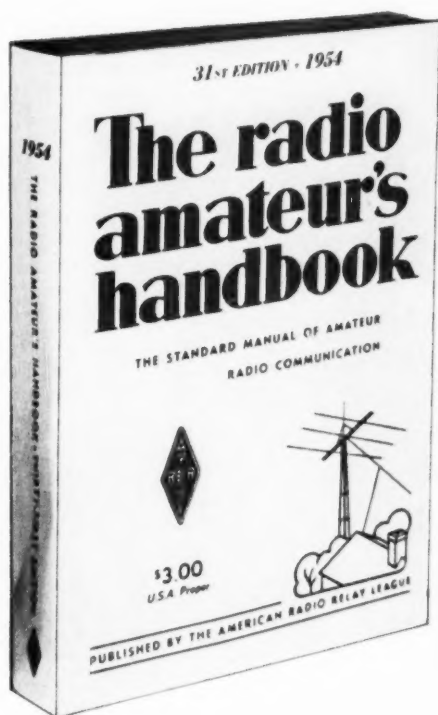
to see on its way to its destination. We'll just have to work a bit faster and get rid of it that much quicker. Give those fellows a break; remember, we may need to call on them some day too. Traffic: (Oct.) W8ZGT 786, NUL 209, NOH 189, JYJ 146, IKX 142, ELW 115, RTN 73, URM 64, FSZ 61, FLM 57, IQJ 53, SCW 43, ZLK 40, FX 35, SPF 34, QIX 28, IV 25, FBV 24, MGQ 24, HKT 21, SVG 21, BSG 18, NEJ 18, FGB 15, DLZ 13, AQA 11, TOP 11, GTM 10, SJF 8, WVL 8, HK 6, ITC 6, MAT 6, OQH 3, SCS 3, EGI 1. (Sept.) W8ELW 70, FLM 42, TBP 37.

OHIO — SCM, John E. Siringir, W8AJW — Asst. SCMs: C. D. Hall, 8PUN, and J. C. Erickson, 8DAE, SEC: UPB. RMs: DAE and PMJ. PAM: PUN. New appointees are MEI and RLR as ORS; DWQ, GQ, OXS, SPV, WRT, and ZCV as ECs. The OCARC meeting of Oct. 17th brought out the following: A Sweepstakes trophy will be awarded to the member group whose top three entrants attain the greatest score; the need of a state-wide mobile frequency was stressed; the council will sponsor a slow-speed net, week days, at 6:30 p.m. on 3580 kc., with an eye toward possibly moving to the Novice band. HOX will be NCS. The next OCARC meeting is tentatively scheduled for Feb. 28th. New officers of the CACARC are LCC, pres.; SQU, vice-pres.; GCP, secy.; and NZC, treas. TZO is installing a ground plane on 20 meters. LAE recently entertained SNG. YCP is giving up DX in favor of traffic. GCA commends the HCL Orchids to MQR, who takes the pains to copy Special Bulletins and CRPL forecasts from 1AW and then retransmit them. AQ received WANE No. 11 HNP. Lucas County EC, had 27 in the S.E.T. and held a hidden transmitter hunt Nov. 22nd. MGC has new beams for 10, 15, and 20 meters. We are sad to report the passing of Jim Lisk, EQ, who for many years was one of the standard amateurs in this section. CRA, HIF, and HNP represented the Toledo Club at the OCARC meeting. The annual club picnic was held on Oct. 16th. YGR's son now is at Fort Knox. From the LAARC (Lima) we hear that HVA, EC, is planning on 30 mobiles for EC work; COV is building a ground plane for 40 meters; UVI is assembling a Viking II; and EJM keeps weekly seds with his brother, 4PRO. The Ashland group held two hidden transmitter hunts, each being won by BTW, and the club has obtained a generator for emergency use. Dayton's RF Carrier informs us that the Club's new address is P. O. Box 44, Dayton 1; the Club's theory and code school is under the direction of OVG and ZOF; ACE has a new jr. operator, Arthur John, jr.; KEF broke the club record in the last hidden transmitter hunt (3 minutes); and the Kiser High Radio Club has the call PCL and is under the direction of JRN. The OVARC/Ether Wave, out of Cincinnati, mentions that QOH has returned from Japan. According to Caracaso, of Columbus, APF, Franklin County EC, has the AREC whipped into good shape with the able assistance of LJ and others; HHM now is operating out of Fort Meade; MRC and his 12-year old son, MRD, are the most recent licensees in the area; and call letter license plate application forms were mailed out by Nov. 2nd. Hasn't the Columbus group done a good job in this department? Toledo's Shark Group reports that WIT, VSB, and WBX are all on 160-meter mobile; PCS and YAT are 40-meter c.w. DX hounds; and IEP has been promoted to sergeant at Camp Sil. The FHARA News Bulletin, of Hamilton, says that SMA has a 60-foot vertical; STL has built a kw. for 20 meters; and IUV's 17 watts has been playing 'em on 75 meters. The Cleveland Area is grateful to DNJ for his on-the-air code classes, while DOG's home instruction still is producing numerous amateurs. Traffic: (Oct.) W8FY 398, UPB 183, GDB 146, YCP 102, HNP 101, DAE 95, CTZ 85, RO 83, AMH 77, DG 73, JAR 72, LMB 61, AJH 51, SRF 43, NYY 31, GZ 28, OUK 23, AJW 21, PMJ 16, JFX 15, MEI 15, WRL 15, AL 12, EQN 12, KIH 10, ZAU 10, BLS 8, WE 8, D7, ET 7, CT 6, QIE 6, DZO 5, HIF 5, HOX 5, TLW 5, AQ 4, ARO 3, MGC 2, UZJ 2, GDQ 1. (Sept.) W8ZAU 13.

HUDSON DIVISION

EASTERN NEW YORK — SCM, Stephen J. Neason, W2ILI — SEC: RTE. RMs: TYC, RBT. PAMs: JLG, JQL. The State Line Radio Club, with members in Rockland County, N. Y., and Bergen County, N. J., has been granted its charter by ARRL with 100 per cent affiliation of its members. All interested hams in the area are welcome and should contact the secretary, K2BPG, for information. ZTZ, activities manager of the SLRC, recently added a 35-w.p.m. sticker to his certificate. A. L. Budlong, of ARRL, was the honored guest at a joint meeting of the AARA and SARA held in Albany. Section net certificates were awarded to ZBS and YOK for activity on NYSEPN. LRW now has enough points to make major in the Signal Corp Reserve. GDD is mobile on 3.8 Mc. JFB is working DX on 144 Mc. ORI is working out FH with 15 watts on 21 Mc. Welcome to the Harmonic Hill Radio League of Mt. Kisco, which recently received its charter from ARRL. WARA held a mobile transmitter hunt recently, with MRQ and OKI taking part. LEL is our new EC for Ulster County; he will be assisted by K2EST. LEL made his first contact on 21-Mc. 'phone, a KP4. MHE is QRL making his new home livable. We regret to report that SQV has joined the Silent Kcs. Appointments: APH and GDD as OBS LEL.

(Continued on page 80)



1954 EDITION

800 pages

700 photo-diagrams

620 tube base
diagrams

Highlights of the 1954 Handbook: a new section on semi-conductor devices (transistors and crystal diodes), new high-frequency transmitters for the Novice and old-timer, extensive revision of the chapter on v.h.f. receiving equipment to incorporate many new units, expansion of section on mobile antennas, revision of TVI and BCI material in the light of u.h.f. and color television, enlargement of the tube tables and base diagram section to accommodate over 150 newly announced tubes. It's packed with information useful to the amateur and professional alike!

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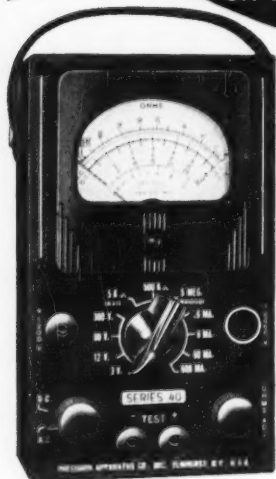
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as EC. Endorsements: HUM as EC. Many choice appointments are now available. Drop a line to the SCM for information. EOM is active on NYSEPN and 2RN phone nets. TRE has a new 200-foot antenna and is working out FB on 3.8- and 14-Mc. phone. Sully also is a member of NYSEPN. The IBM Radio Club and AARA held very successful auctions recently. K2DKI (14 years old) received his General Class ticket. PEM is active on 28 Mc. Traffic: K2NAG 105, W2TYC 87, E2U 70, K2BSD 53, W2LRF 40, ILI 38, GDD 37, APH 31, MRQ 21, EOM 19, OKI 15, K2BDJ 7.

NEW YORK CITY AND LONG ISLAND — SCM, Carleton L. Coleman, W2YBT — Asst. SCM, Harry Daniels, 2TUK. SEC: ZAI, PAM: JZX, RM: VNJ. The NYC-LI traffic nets now operate at the following times and frequencies: C.w. on 3630 kc. and 'phone on 3943 kc. at 7:30 P.M. Mon. through Fri. The 146.1-Mc. Net operates Tue. and Thurs. at 8 P.M. and on Sun. at 10 A.M. ELT, UCB, SMQ, and ZJJ are active in the ragchewing net. KGN made WAS on his Viking I recently in addition to his work in Brooklyn C.D. VNJ, the RM, reports NJI c.w. net attendance is up, with IVU, GP, LPJ and UXV among the mainstays. EC has a new 40-foot aluminum mast and does FB on c.w. traffic. PF reports good attendance in the QCWA Net Sun. at 1100 on 3810 kc. VL is doing well with his mobile rig and also is active in the MARS Net, TUK operated /4 while in Virginia with KFV schedule. IVS has a new all-band rig with a 6146 final. AIQ did a very good job helping to clear up the QRM to the 2-meter boys caused by WSY who operates just outside the band, and is getting new final amplifiers to clear up the trouble. EYV a new MARS member, is ROTC at Brooklyn Polytech. KJG, very active in 'phone traffic nets, has a new 20-meter ground plane and is building a kw. rig to go with it. JOA reports QRM from school and transmitter construction knocked him out of the BPL. Anyone playing a musical instrument is asked to contact LKX, who is trying to form an all-ham band or orchestra. ENJ is a new member of the New York Radio Club, MUM made WAS and the A-1 Operator Club this month. NJI made membership in NYSPN as did OME, who now is mobile on 10, 20, and 75 meters. VUZ and KVV check in the Early Bird Net at 5:30 A.M. SNA is helping a handicapped ham get started. IN is looking for traffic outlets on 2 meters, and has an s.s.b. rig under construction. DYK made a recent hunting trip. OMG is active in NJI and TAN. The Brooklyn AREC group made over 700 points in the S.E.T. IEJ, DIR, and KGN have received RACES tickets. KGN made 25,000 and BSM 20,000 points in the CD Party. AIQ and IWH did FB in the Frequency Measuring Tests. The New York Radio Club held a dinner Oct. 9th. New members are DRI, FGZ, KTG, ODJ, K2CTZ, DUZ, and EAF, who is ex-4URB. KTG visited W5-Land recently. GF is back in W4-land after a month's visit home. The Minola Fair and L. I. Agricultural and Industrial Exposition ham civil defense display was very successful due to the work of KFV, OBU, TUK, and KEB. KEB was on hand every day explaining ham-c.d. operations. Radio classes are held one afternoon a week. Contact JZX for information. AEE has completed electronic break-in which OLA reports FB. RWQ, EC, and OGX are active OOs. ZAI reports 139 mobile units in the N. Y. C.-L. I. section and 699 emergency radio units operating in 18 emergency nets, again over the previous totals. OWL's daughter was married Oct. 10th. K2DC doubled up Oct. 4th and his QTH now is Lincroft, N. J. ZE gave a lecture on a.s.s.c. reception and transmission at the Oct. New York Radio Club meeting. Traffic: (Oct.) W2LPJ 254, IVS 203, NJL 202, KJG 170, JOA 153, AEE 130, EC 125, JZX 116, VNJ 98, OMG 69, IIG 53, IVU 48, VL 36, GNG 29, K2BKW 27, W2OME 24, OBU 19, LKX 18, KF 16, PF 13, CLG 12, GP 12, UXV 12, IN 7, YBT 7, MUM 6. (Sept.) W2GXC 69, AEE 51, IVU 25, WL 5.

NORTHERN NEW JERSEY — SCM, Lloyd H. Manamon, W2VQR — SEC: NKD, PAM: CCS, RMs: NKD, WCL, CGG. The RACES licensees have arrived from the FCC and we now can proceed with a definite objective in view. All 13 Civil Defense Areas in New Jersey are covered and the Radio Officers in each Area were presented with their RACES authorizations at a meeting held at the State Office of Civil Defense on Nov. 9th. RACES planning at state level is now complete. State Civil Defense Officials have purchased a complete 1-kw. station for our use at the State Control Center. It is their intent to purchase and install similar stations at each of the 13 area control centers. DXD has made application for the first OBS teletype station in the section. ABL is busy fixing up the new home. KN2CBP is a new ham in Tennek. NYV received WANE (Worked All New England) certificate No. 12. KN2CZY and KN2CZX expect to go for General Class soon. ADP worked EA9DD for a new country. HXU has his 100 countries for DXCC, but is sweating out the confirmations. AQT is on 40-meter 'phone for a change. LOB reports a very successful S.E.T., having worked with a large group of amateurs who were on the air for a local volunteer fire department exercise. IKF has applied for a WAS certificate. BVS is building a new rig for better coverage in the OBS work. He has worked 47 new countries since the first of the year with 50 watts input. K2BUW was a recent speaker at the RVRC. Sorry to learn of the illness of CUL. The RVRC

(Continued on page 88)



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3W5000F3	2-25A
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station, QW, is very active in contest work. The newest club member is YGP. FQN attended the recent state level civil defense meeting in Trenton. We regret to report the passing of a great amateur in the section, GJF, who always gave unsparringly of his time in an effort to help others. DMJ and FRA are busy with civil defense work in Wood-Ridge. An excellent OO report was received from GVZ. WYU/2 was activated at the Franklin Lakes C.D. Headquarters during an area-wide drill on Oct. 14th. TAA assisted with mobile operations. CVF, Area 1 Radio Officer, reports a new high in drill attendance with 158 stations checking into the Bergen-Passaic County Net. K2DHF is on s.a.b. with a new rig. This time it's a pair of 4-125s in the final. NIE is on all bands with a new 4-250 final. KHI has just completed a new 4-250 final for all-band operation and reports no TVI running a full input on 20 meters. The MCARA election of officers is coming up. ENM is heard mobile on 2 meters using new Conset rig. EGM has purchased portable 2-meter gear for use by the local defense council. BTG and YLS spent Thanksgiving holiday with JSWE up in New England. GUM was elected c.d. communications manager for the City of Long Branch. Your SCM extends Season's Greetings to all and wishes to thank all hands for the splendid cooperation received throughout the past year. Traffic: W2NKD 114, CGG 107, CUS 63, FPM 23, HIA 11, HXP 3, IKF 3, JKH 2, NLY 2, LOB 1.

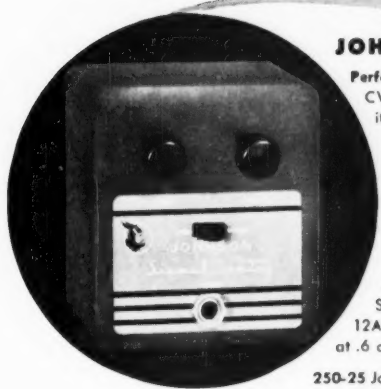
MIDWEST DIVISION

IOWA—SCM, William G. Davis, W0PP—QVA reports new stations on TLCN are GSH, KSF, HXA, and MDJ. ATA is back at Ames and reports that he has complete stations, both at home and at the University. BQJ is having trouble with the Indians. CQL and his wife, DDU visited with QVA on their way home from a visit in West Virginia, where they visited with Dad, 8AKQ. DFD has moved from Des Moines to Poughkeepsie, N. Y. He's with IBM. OZO is about ready with his 1/2-kw. final. YKS has moved from Tama to Maquoketa. The IARC, of Burlington, participated in the S.E.T. Oct. 3rd. They had 1 fixed, 1 portable, and 4 mobiles in operation on 75 meters but were crowded out by a thunderstorm which hit just as they were getting underway. USN has been reactivated, with MGU as chief operator. YTA is back on traffic skeds and operating 75-meter mobile to and from work each day. New officers of the Iowa Great Lakes Ham Club are DFV, pres.; FNJ, vice-pres.; PZF, secy.; and CQL, treas. A new licensee is Gene Carpenter, with the call HWX. BAL, DIB, and PP are busy with preliminary work preparatory to WHO-TV. The Newton Club now has 25 members, 12 General or Advanced Class, 8 Novice, and 5 coming along. Two of the Novices are YLE, PP lost the race for mayor by 41 votes. What a relief! Traffic: W0BDR 630, SCA 545, CZ 274, YTA 142, QVA 89, OZO 47, GXH 41, BLH 40, BBZ 36, ERP 30.

KANSAS—SCM, Earl N. Johnston, W0ICV—SEC: PAH, PAM; FNS, RM; KXL. The Johnson County Radio Amateur Club held its first annual banquet at Quivera Lakes Oct. 8th with 160 amateurs from surrounding areas attending. It was reported to be very successful with such ARRL officials as IBUD, of ARRL Headquarters, Midwest Division Director OZN, and Vice-Director MVG attending. Club officers elected were WMH, pres.; LQV, vice-pres.; DEL, treas.; GUP, scribe; GLN, act. mgr.; UQV, pub. mgr. The Lawrence Amateur Radio Club has affiliated with ARRL. Officers are VBQ, pres.; FON, secy.; JUV, treas. The Club plans to hold code and theory lessons for the high school group and others interested in amateur radio. Also work on a 6-meter net is progressing. Members of the Kansas 75 Phone Net in the Dodge City Area were on the job during the snowstorm Nov. 6th and 7th handling traffic for power companies and keeping in contact with mobiles in the stricken area. The High School Club in Olathe is quite active. DRB has increased power to 500 watts and is very active on QRS and 75 Phone Net. QNJ has a new 75-meter mobile. ZLX is building new 100-watt rig for 10 meters and is organizing a 10-meter net for c.d. Traffic: (Oct.) W0NY 175, OHJ 158, BLI 105, WMQ 90, FEO/0 69, FON 41, EOT 40, UJV 34, BET 33, YOS 32, QQQ 22, LOW 16, LIX 15, MLG 12, KSY 10, FDI 9, ICV 9, DEL 8, VBQ 8, MAE 6, WXE 6, YFE 5, JDX 4, FHC 3, RKS 2, (Sept.) W0NY 190, IIS 27, FEO 26, MLG 16, EOT 14, LIX 10, FDI 7, IUB 6, VBQ 6, ICV 4, LQW 1, YFE 1.

MISSOURI—SCM, Clarence L. Arundale, W0GBJ—SEC: VRF, PAMs: AZL and BYL, RMs: OUD and QXO. RCE reports 49 amateurs, including 29 mobiles, participated in St. Louis S.E.T. activities. Other reports of S.E.T. activity: UBR for Kansas City and EBE for Springfield. A number of St. Louis Area stations participated in the Egyptian Radio Club C.D. activities Oct. 24th. YMO has moved to Benton. MON certificates go to BZK and JLS. FNN has qualified for DXCC, WAS, and WAC. CUZ and KVV have a new HRO-60. AZL is rebuilding to eliminate TVI. FKM is TVling his rig. QGR received his Gen. Cl. license. CAX has a BC-610 on the air. NDS has put up a 20-meter beam. HUI replaces EBE as EC in Springfield. AOP replaces QXO as EC in Columbia. MRV is building a VFO for his Heathkit rig. ARH and HUI worked considerable DX on 15 meters. CKQ and JLS qualify for the 1000

(Continued on page 84)



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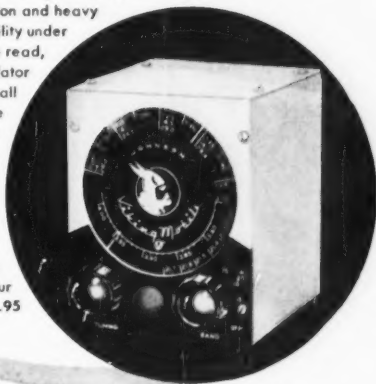
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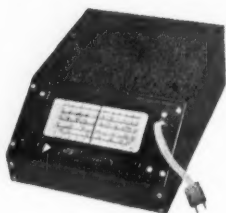


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Trafficers Club certificate and CPI gets his 10,000 certificate. BVG is in Kansas City taking additional radio training. CKQ is unable to get enough grid drive for the 2-meter rig. AREC members: DSW, LFW, MAQ, and NVH. BVL reports EBTN had a big traffic month. Recent new hams are WN6s RBL, PTE, and QWS and W0RFK, PDR, and PIR. BPL certificates go to CPI and QXO. DIANA wants a 40-meter traffic schedule with some Missouri station, so contact GHB for further details. LQC is giving code lessons on 10 meters. BFD transferred his mobile rig to the new Buick. The Rolla Club is training another group of prospective hams. The Washington University Amateur Radio Club and the St. Louis University Amateur Radio Club held a joint meeting. Traffic: W0CPI 1308, QXO 968, BVL 175, GBJ 150, GAR 138, LJS 120, CKQ 90, HUT 49, BZK 26, CXE 24, QUD 23, KIR 22, EBF 20, BAF 19, QWB 13, HUT 6, ICW 6, CXZ 4, WAP 1, KZR 2, ETW 1, JHY 1.

NEBRASKA — SCM, Floyd B. Campbell, W0CBH — Asst. SCM: Thomas S. Boydston, W0VYX, SEC: JDDJ, PAM: EUT, RM C.W. Net: LJO, PZH now has two 50-ft. towers, RS mobilized to Texas. WN0QGV, WN0QLA, and RIG are new calls in North Platte. JHI now is located in North Platte. The C.W. Net has 24 stations on roll call. Average daily attendance for October was 13.4. Traffic handled during sessions totaled 199. The NCS are JDDJ, RDN, LOD, and IXL. The boys are doing a fine job, confirmation of which can be had by listening on 3520 kc. New officers of the Hastings Amateur Radio Club are AQE, pres.; LJO, vice-pres.; OMH, secy-treas. AREC blanks are available from the SCM. Club secretaries are requested to state the number wanted. UVV is experimenting on 420 Mc. and is very much interested in amateur television. RDN is NCS of Tenth Regional on Tue. using NC-240D. EQB has been teaching code to a Boy Scout troop. Fourteen mobile units from the North Platte Club were on patrol duty Halloween. The Control Station was located in the Fire Station. Reports from the Chief of Police and Fire Chief state it was the quietest Halloween in years. A recent Ammono truck explosion should teach the Douglas County Sheriff the importance of considering the offered assistance of the Ak-Sar-Ben Club. Batteries ran down, which resulted in no lights or radio. Traffic: (Oct.) W0RDN 178, VYX 52, ZJF 50, NAA 49, KDW 39, EGQ 29, EQB 28, MJK 27, LJO 24, MAO 17, LRK 14, CBH 11, HTA 11, SAI 10, TIP 10, K0WBF 9, W0DJU 8, EUT 8, QHG 8, K0FBD 7, W0KWQ 6, QOU 6, IBA 5, BEA 4, FSE 3, OFI 3, GTW 2, LGN 2, ORW 2, HQN 1. (Sept.) W0BLR 546.

NEW ENGLAND DIVISION

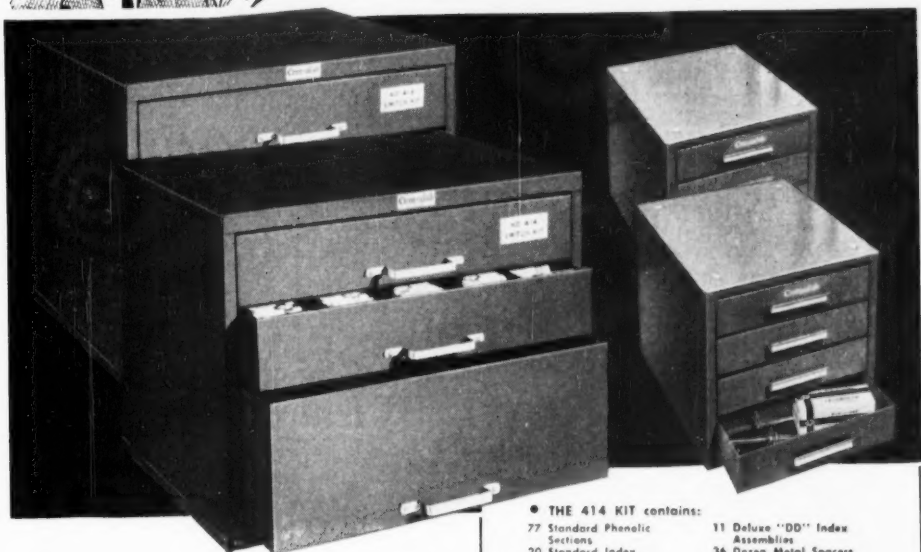
CONNECTICUT — SCM, Roger C. Amundsen, WH1YF — SEC: LKE, PAM: FOB, RM: KYQ, CN-3640, CPN-3880, CEN-29,580 kc. AW kept things hot two ways by making BPL and with a fire which luckily did little damage to radio gear. ORP is busy DXing. TCW, new EC for Stratford, reports the SARA is a busy club. WPR and YVM are new ORS. YVM also is new OFS. ODW changed jobs. FSH is new EC for Manchester. CUH has been hunting. BVB is enjoying low power TNX, along with many others, enjoyed the CN Party. RWD, new Communications Officer of Area 2, says that Area 1 Director Alden Amundsen has done an excellent job with the Albert Net. Full credit goes to DBM, FRL, ODW and many others at local level who are the full team. RAN is busy at college and with contests. YBH and WNH are first reporters. YL is at Headquarters are YVM, 2RTZ/1, and Novices ZCS (also technicians). ZID, ZJE, ZIM, ZIK, and ZIB. HUM has a Viking II. CRU participated in the F.M.T. KUO is back on with ARC-5. BFS is a new ORS. WN1ZJY and WN1ZJZ are new in New Haven. YON is busy operating TIB. WMA is going to Chicago. FWH renewed EC appointment. SXR and NUB are building new rigs. MQM is waiting for 10 meters to open. ASK, LRT, MZZ, CAD, NQJ, MQM, and TYT with UWY, are all inside a four-block square in Bridgeport. Happy New Year, gang. Traffic: (Oct.) WIAW 400, KYQ 206, NJM 144, RRE 140, EOB 102, LIG 100, EFW 94, CUH 90, FOB 82, FTM 70, HYF 60, QJM 57, RFJ 41, YBH 34, UNG 33, BVB 26, YVM 25, TNX 24, HUM 21, NEK 16, VOV 16, BDI 15, SJ 12, WNH 5, ORP 4, RAN 4. (Sept.) WIOB 53, RAN 4.

MAINE — SCM, Bernard Seamon, W1AFT — SEC: BYK, PAM: BTY, RM: LKP. The Pine Tree Net meets Mon. through Fri. on 3596 kc. at 7 p.m. The Sea Gull Emergency Net meets Mon. through Fri. on 3960 kc. at 5:30 p.m. The Sheepscot Valley Net meets Mon. through Fri. on 3710 kc. with WTG as NCS. The "Sea Gulls" took part in two e.d. drills during October to test communications, with good results. SUK is building a new 200-watt all-band job which is almost ready. BKU reports he will be in the air for the winter while he is hatching a new rig. AMR has sold the Mouse House and Q1Tied to Edgecomb. The sad part of the whole thing is that Paul now has taken up "one-eyed monster" squinting. LHA also has a new QTH in Boothbay Harbor from which he will pour forth his gallon(s). VV has returned to his duties with PTL in Bingham after a brief rest at his home in Portland. ARV is branching out and is becoming A. T. & T.'s chief competitor. KAS has a brand-new 60-ft. sky hook. Many of the Maine gang have been heard operating portable and mobile while out hunting.

(Continued on page 86)



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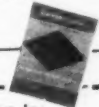
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NEWTON 58, MASSACHUSETTS

deer. Please help your SCM by sending along notes of interest concerning your station and your activities. A Happy New Year to all the Maine gang and to all our good neighbors. Traffic: WILKP 162, BX 67, TWR 52, VYA 52, PTY 36, EFR 25, AFT 22, SUK 16, HXQ 12, WNIYDX 1.

EASTERN MASSACHUSETTS — SCM, Frank L. Baker, jr., WIALP — New appointees are TRC Maynard, RFE, Middleton, DOF Revere as ECs; QQW and RCJ as OES. Appointments endorsed: ECs: FWS Milton, HP Merrimack, RM as member of Region 5 Comm. OBS: UIR. We are sorry to have to report the death of HRF, GEQ, and CBY. FWS's son-in-law has the call YUK and is up in VO-Land. Hams in Whitman, Braintree, Weymouth, and Dedham helped the police on Halloween to keep down the destruction of property. BNS, mobile, is having a great time on 10 and 75 meters while traveling around the eastern part of the country. LZW is doing nice work on 75 meters with a VE, keeping a sked for someone in the hospital in these parts. Heard on 10 meters: TTS, JLN, MNW, WGM, VMU, RTG, RMB, RSP, VRK, YEO, TUP, QNC, KLO, UZK, AWO, HHG, and VBB. Mobile on 10 meters: RES, JDS, KEL, and WFQ. UZK is on 2 meters. EPE is active in the Eastern Mass. Net. JCK is in Georgetown University Hospital, Washington, D. C. A simulated emergency test was held in Weymouth by KWD and the following helped out: GOU, WFQ, BNS, TYN, FWS, VPR, SH, CQN, THY, ALP, EKG, VKR, and TAA. CTR is living in So. Braintree. The Wellesley Amateur Radio Society held a meeting on c.d. work. OFK now lives in Boston. MKW has a class of hams-to-be, and is on 15 meters. RFE's son is WNIYRM. The following took part in the September F.M.T.: WK, AYG, BGW, HSY, and LLE. LM has a sked with VE2LO. Quebec. BB and his c.d. group have 20 crystal transmitters coming along. UOC is doing an FB job fixing them up. TQS has a new VFO. PEX has an ARC-4 converted to a cascade front end on 2 and ATD is on 80 and 40 meters running 175 watts. SNO now is in Peabody. New officers of the North-eastern Univ. Radio Club are UIZ, pres.; WJD, vice-pres.; WNIYYP, secy.; TVZ, treas.; QMJ, trustee of KBN. ZEV, VKT, and THW are other members. New officers of the Yankee Radio Club are SCG, pres.; PCE, vice-pres.; UWG, secy.; QPB, treas.; TY, ham tamer; AAT, RVQ, and SAK, directors. Our sympathy to JOJ on the death of his daughter. ALP wants to thank everyone for the cards received on the death of his mother. CLS reports the following have equipment on 420 Mc.: CLS, DYY, QMN, OOP, PZA, RFU, HDQ, and HDE. ALP spoke before the Framingham Radio Club. A new club, the Radio Amateurs Open House, has been formed with TWG, chairman; UVC, treas.; YHM, secy. Those at the first meeting were UVC, YHM, UEI, YPN, URT, FWH, NYU, OED, YIZ, CG, VKE, TON, HAS, YHK, OPI, and K2BAH. REI is new secretary of the Gypsy Radio Club of Haverhill. Members who attended the hamfest at Concord, N. H., were SNZ, TOY, UHH, UUT, RYV, QWP, RLF, OLN, LBT, HP, PBT, DON, RYJ, QUY, RZZ, HQQ, TJJ, SRH, VFK, UIB, and REI. PBT is on 75 meters, s.b.c. UUT has the hi-fi bug. WNIWTK passed his Tech. Class exam and his XYL passed her Novice. Officers of the Merrimack Valley Amateur Radio Club, NBN, are SZO, pres.; SSC, vice-pres.; Alvin Harvey, secy.; SSZ, treas.; TUB, act. mgr. Board members are SZO, SSC, SSZ, SMI, and JED, who is trustee of NBN. AVY installed signal lights at c.d. headquarters for Alerts, also battery-charger equipment for emergency power supply batteries. The South Eastern Mass. Amateur Radio Assn. would like to hear from other clubs. UOC has his General Class license. Winthrop's Simulated Emergency Test had the following on: SBT, BDU, CMW, DJ, OIR, MQB, NMN, QUN, VIS, UOC, GGP, HFI, LVA, BB, KWD, Tony Appleate, Novice, and many XYLs. Ed Handy, of ARRL, and Frank Bramley, of Motorola, spoke at the South Shore Club on various phases of c.d. and equipment for mobile units. QQL is in the hospital. KJD has a new car with an Elmac rig in it. XYL is a new ham in Bedford. SPL has mobile rig in his new Mercury. KJO is mobile on 10 meters. KIQ is ex-KH6AGS. RLT is going mobile with Elmac. KQZ, QZS, and REI took part in the ground-breaking ceremonies for the new W. E. plant in No. Andover. SNZ's brother has his Tech. Class license. ZJK, SLX has new HT-9. SNZ is a member of the Deep Sea Drag Net. During a recent storm the Winthrop C.D. was activated. Those on hand to help out were WFQ, WNN, WFN, WGM, WSN, ALP, K2ADA, BB, DJ, MTB, RZP, in Belmont, is the son of Ed Handy. BDI. They keep a weekly sked on 80-meter c. Traffic: BDI, WILYL 92, EMG 81, TY 78, AVY 71, LM 68, NUP (Oct.) WILYL 92, EMG 81, TY 78, AVY 71, LM 68, NUP 66, EPE 40, BY 28, UTH 26, BB 18, UE 11, WZAPH 10, WIPX 9, CTR 6, HWE 4, AHP 1, LLY 1, (Sept.) WIEPE 20, TQS 11, MAC 2.

WESTERN MASSACHUSETTS — SCM, Roger E. Corn, WIJYH — SEC: KUE, RM: BVR, PAM: RDR. WNN meets at 7 p.m. Mon. through Fri. on 3560 kc. UKR walked off with top traffic honors this month. She was the only phone operator who reported, too. New officers of the HCRC are QUQ, pres.; KUE, vice-pres.; NLE, treas.; and PHU, secy. UBD, VNH, WCV, and WFL were elected members of the Club's executive committee. MVF has a newly-installed TBS-50 in his car. New appointees are WDW as ORS, EFQ and WEF as OOs, CJK as OPS, and

(Continued on page 88)



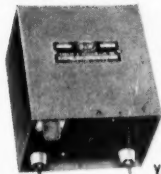
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Model 701 for 15 meters
Model 702 for 20 meters

Housed in heavy gauge steel, weather-proofed cases fitted with coax input connectors and ceramic feed-thru output terminals.

Impedance—75 ohms unbalanced, to 100 ohms balanced.

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Weight—less than 3 lbs.

\$16.50

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Housed in heavy gauge steel, weather-proofed cases fitted with coax input connectors and ceramic feed-thru output terminals.

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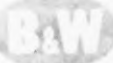
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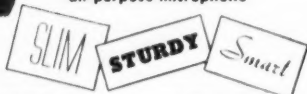


Here's the new **SHURE** **SLIM-X**

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give you an ideal low-cost
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LIGHT! The new "777" Slim-X Microphones are rugged little microphones weighing only 6 ounces! They are designed for good-quality voice and music reproduction. Their versatility and "hand-a-bility" make them ideal for use by lecturers, announcers, instructors, and Hams; for audience participation shows; carnivals; panel and quiz shows; and use with home-recorders. When mounted on either cradle or swivel, the "777" can be removed in a flash (no tools necessary)—simply by lifting it out of the holder. This makes it an ideal "walk-around" hand-held microphone.

TECHNICAL INFORMATION: Smooth frequency response—60 to 10,000 c.p.s.; special-sealed crystal element—for long operating life; high impedance; 7' single-conductor cable, disconnect type. Dimensions: (Microphone only) Length, 4 1/2"; Diameter 1". Finish: Rich satin chrome overall.

NOTE: Lavalier cord for suspension of Microphone around neck is included.

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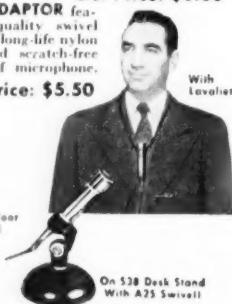
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JY as EC, JY will coordinate amateur and Massachusetts National Guard communications for both the Eastern and Western Massachusetts sections. Appointees are reminded that certificates must be endorsed annually and activity reports must be sent to the SCM with reasonable regularity in order to keep appointments valid. LJB, BPA, CJK, WEF, and JYH were active in the phone section of the CD Party while RAN, YCG, RRR, COI, BDV, and JYH took part during the c.w. week end. CJK and JYH were QSO on five bands during the phone section. TDO is a student at Syracuse U. this year. DXW is building a sea-going rowboat. QJN has just returned to the section from England. TVJ has returned to Worcester Academy but is still active on 1RN. COI is active on 21-Mc. phone. Former OXBD now is operating YBE in W. Stockbridge on 20- and 75-meter phone. TTL and VNH have applied for OES appointment. MUN has prepared an excellent graphical analysis of reading made during the September F.M.T. and will furnish copies on request. Traffic: (Oct.) WUKR 122, RVR 60, HRV 47, MNG 31, MVE 29, HRC 23, WDW 20, TAY 18, JYH 9, GVJ 7, SRM 7, TVJ 7, OBQ 1 (Sept.) WITFA 31.

NEW HAMPSHIRE—SCM, Carroll A. Carrier, WIGMH—SEC, BXU, RM, CRW, PAM, UNV. This report is being written by CRW as our SCM still is seriously ill in the Elliot Hospital in Manchester. At the time of this writing Cal's condition has slightly improved. TBS worked YV5EH on 80-meter c.w. with 15 watts and VP9BF on 40 meters with 7 watts. NHN, 3985 kc, is getting lots of new members but can always use more. COC is increasing power to 300 watts. CDX now has HERTA and WNH certificates. POK has applied for membership in the QTC. FZ is on NHN. QGU is back at K2HH. QJX keeps us informed of Cal's condition. SAL is trying out different antennas. Wouldn't some of you fellows I don't hear from like to have your call in this column? Please send in reports. Address WICRW, P. O. Box 105, Salem, N. H. Traffic: WICRW 188, CDX 46, POK 37, QJX 25, COC 5, QGU 5, FZ 3, TBS 2.

RHODE ISLAND—SCM, Merrill D. Randall, WJBBB—SEC, MIJ, RM, BTU, RIN meets every evening at 7 P.M. EST on 3540 kc.; RI CD every Sun. at 10 A.M. EST on 3993 kc.; RI Phone every Sun. at 11 A.M. EST on 1890 kc. No word has been received from VXC on the proposed YL net but there is plenty of word on her numerous other activities. Ex-ASZ-BTP-YXP has a new call and a new QTH. He now is 4C1P and operates his Viking-H and R-A-128 in Charlotte, N. C. We were very pleasantly surprised when the turnout for the preliminary meetings for the proposed R. I. Council of Hams disclosed representatives from nine R. I. clubs and interested non-affiliated amateurs to the total of 26. JFF, who spends his days installing TV antennas on all kinds of roofs, slipped two steps on a step-ladder at home and severely wrenched his ankle. Our sympathies to 4CVO/1 on the loss of a close relative. We are understandably elated at the traffic report for this month. We hope it continues! Traffic: WITGD 109, BBN 73, VXC 52, BTU 49, TRX 32, CPV 29, OIK 21, ULS 10, AIT 4.

VERMONT—SCM, Robert L. Scott, WIRNA—SEC, NLO, PAM, RPR, RM, OAK, Rutland and Chittenden Counties are the only ones heard of as being active in the S.E.T. Rutland had 10 members operating. QMM moved from Sheldon to Enosburg Falls. TEL is rebuilding his large dairy barn, etc., after a disastrous fire. ETE completed printing installation and now is working on an 813 final. AEA is making a good recovery from a badly broken ankle. Charlie still is addicted to s.s.b. SAT has a Collins KW on the air with a 10-over-20 beam and dipoles for 160, 80, and 20 meters. Some "rare" Vermont stations have been appearing on VTNP Sunday mornings lately. Traffic: WIOAK 200, IKA 130, AVP 34, AZE 31, TAN 28, RPR 27, FT 21, VVP 17, BJE 13, KJG 8, TEW 8, QNM 4, ELJ 3, AXN 2.

NORTHWESTERN DIVISION

IDAHO—SCM, Alan K. Ross, W7IWU—Lewiston. IDZ reports at least 3 fellows building up 220-Mc. gear. HGG bought a new transmitter and receiver and is busy on 40- and 20-meter c.w. Hayden Lake: FIS was obliged to leave Idaho because of the closing of his CAA station and has moved to Missoula. Caldwell: EYR comes out of hiding to report completion of a new 250-watt rig. Boise: NVO has the 3.9-Mc. antenna up now and gets out much better. Yours truly made a little trip East and appointed three new Emergency Coordinators, namely, ABK Mountain Home, TPC Bliss, Q2V Shoshone. I also am working with the Boise Filter Center, to promote test communications between Boise and their Ground Observer Posts in Idaho. The Gem State Radio Club is trying to find a location and a building for a club house. Traffic: W7FIS 25, NVO 6, EYR 1.

MONTANA—SCM, Edward G. Brown, W7KGJ—This is another month when most of the fellows have been too busy to send in the dope on their activities. TKR has been hearing some good 80-meter DX the last few weeks. Dan has heard VR2 U, LU7AZ, LU3EL, ZKIBG, CE3AG, and plenty of ZLs. DXQ is putting all his test equipment into a portable cabinet. FTO reports Lewistown amateurs

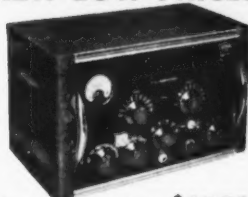
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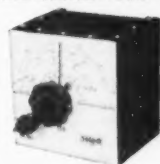


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10 M. BEAMS

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D104T • DeLuxe 10m 3-El. T match, \$25.95. 1 — 8' Boom, 1/2" Alum. Tubing; 3 — 6' Center Elements, 1/2" Alum. Tubing; 6 — 6' End Inserts, 1/2" Alum. Tubing; 1 — T Match (4'). Polystyrene Tubing; 1 — Beam Mount.

S104T • Std. 10m 4-El. T match, \$24.95. 1 — 12' Boom, 1/2" Alum. Tubing; 4 — 6' Center Elements, 1/2" Alum. Tubing; 8 — 6' End Inserts, 1/2" Alum. Tubing; 1 — T Match (4'). Polystyrene Tubing; 1 — Beam Mount.

D104T • DeLuxe 10m 4-El. T match, \$30.95. 1 — 12' Boom, 1/2" Alum. Tubing; 4 — 6' Center Elements, 1/2" Alum. Tubing; 8 — 6' End Inserts, 1/2" Alum. Tubing; 1 — T Match (4'). Polystyrene Tubing; 1 — Beam Mount.

15 M. BEAMS

S152T • Std. 15m 2-El. T match, \$22.95. 1 — 12' Boom, 1/2" Alum. Tubing; 2 — 12' Center Elements, 1/2" Alum. Tubing; 2 — 5' End Inserts, 1/2" Alum. Tubing; 2 — 7' End Inserts, 1/2" Alum. Tubing; 1 — T Match (6'). Polystyrene Tubing; 1 — Beam Mount.

D152T • DeLuxe 15m 3-El. T match, \$39.95. 1 — 12' Boom, 1/2" Alum. Tubing; 3 — 12' Center Elements, 1/2" Alum. Tubing; 2 — 5' End Inserts, 1/2" Alum. Tubing; 2 — 7' End Inserts, 1/2" Alum. Tubing; 1 — T Match (6'). Polystyrene Tubing; 1 — Beam Mount.

20 M. BEAMS

S202N • Std. 20m 2-El. (No T), \$21.95. 1 — 12' Boom, 1/2" Alum. Tubing; 2 — 12' Center Elements, 1/2" Alum. Tubing; 4 — 12' End Inserts, 1/2" Alum. Tubing; 1 — Beam Mount.

S202T • Std. 20m 2-El. T match, \$24.95. 1 — 12' Boom, 1/2" Alum. Tubing; 2 — 12' Center Elements, 1/2" Alum. Tubing; 4 — 12' End Inserts, 1/2" Alum. Tubing; 1 — T Match (8'). Polystyrene Tubing; 1 — Beam Mount.

D202N • DeLuxe 20m 2-El. (No T), \$31.95. 2 — 12' Booms, 1/2" Alum. Tubing; 2 — 12' Center Elements, 1/2" Alum. Tubing; 4 — 12' End Inserts, 1/2" Alum. Tubing; 1 — Beam Crosspiece, 1/2" Alum. Tubing; 1 — Beam Mount.

D202T • DeLuxe 20m 2-El. T match, \$34.95. 2 — 12' Booms, 1/2" Alum. Tubing; 2 — 12' Center Elements, 1/2" Alum. Tubing; 4 — 12' End Inserts, 1/2" Alum. Tubing; 1 — T Match (8'). Polystyrene Tubing; 1 — Beam Crosspiece, 1/2" Alum. Tubing; 1 — Beam Mount.

S204N • Std. 20m 3-El. (No T), \$34.95. 1 — 12' Boom, 1/2" Alum. Tubing; 3 — 12' Center Elements, 1/2" Alum. Tubing; 6 — 12' End Inserts, 1/2" Alum. Tubing; 1 — Beam Mount.

S204T • Std. 20m 3-El. T match, \$37.95. 1 — 12' Boom, 1/2" Alum. Tubing; 3 — 12' Center Elements, 1/2" Alum. Tubing; 6 — 12' End Inserts, 1/2" Alum. Tubing; 1 — T Match (8'). Polystyrene Tubing; 1 — Beam Mount.

D204N • DeLuxe 20m 3-El. (No T), \$46.95. 2 — 12' Booms, 1/2" Alum. Tubing; 3 — 12' Center Elements, 1/2" Alum. Tubing; 6 — 12' End Inserts, 1/2" Alum. Tubing; 1 — Beam Crosspiece, 1/2" Alum. Tubing; 1 — Beam Mount.

D204T • DeLuxe 20m 3-El. T match, \$49.95. 2 — 12' Booms, 1/2" Alum. Tubing; 3 — 12' Center Elements, 1/2" Alum. Tubing; 6 — 12' End Inserts, 1/2" Alum. Tubing; 1 — T Match (8'). Polystyrene Tubing; 1 — Beam Crosspiece, 1/2" Alum. Tubing; 1 — Beam Mount.

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GOTHAM HOBBY

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have organized a club and entertained the Harlotown Club Nov. 20th. CT visited relatives in Washington recently. MKB was home for a few weeks en route to Georgia, where he will be stationed for about one year. MM is building a new mobile rig. KGF has been on the air with his new rig. Pete is running about 120 watts and says it's better than his old kw. rig. OPM is planning to start on his new portable mobile soon. Our state civil defense director is very anxious to have the Montana amateurs submit an emergency plan for possible RACES activities. All who are willing to help in emergency work should drop a line to KJH so that Walt can get something started. Traffic: WTKB 11, MM 37, SFK 27, OPM 24, TGU 12, PCZ 8, CPY 6, RDO 6.

OREGON—SCM, John M. Carroll, W7BUS—The Rogue Valley Radio Club advises that TVI problems are arising but are being overcome generally. RE now is operating on 20 meters with little interference. FRO and his XYL, GLK, are building a new QTH on acreage to avoid TVI. DBZ's new QTH is in Central Point. LNG now is operating on 20 meters. TJJ still is logging in the big timber. QMK and son, SBT, are on all bands with a Bandmaster. ISP is on 40 meters hunting DX. EZR and OEK are active in the OE Net. AJN is new Route Manager for Oregon. PRA has a new 75A-3. PKN shows high traffic activity. PHJ is consistent on Oregon SN. Traffic: WQPS 52, AJN 51, TH 45, PJA 22, EDU 4.

WASHINGTON—SCM, Laurence M. Selbring, W7CZY—SEC: QZF, RM, FIX, PAMs: EHH, PGY, ZU is back on the air. UMK handles traffic on WSN and RN7. The Apple City Radio Club is training CAP cadets in procedure. EVW works 29.6-Mc. mobile and MARS. Pullman amateurs aided the local police on Halloween. SARC was active during the S.E.T. FWD is TVing. FWD and rebuilding. OE is the new Net Manager of WSN. RT made BPL. The Lake Washington Radio Club was active in the S.E.T. with GXP operating the control station, BB, and MQB, JWE, TES, QGF, and AWG participating. CWN has better luck hunting DX than deer. HDT has a new Gonset converter. JJK, OEB, TGO, and SMB entered the SS Contest for the VARC. JJK has a 20-meter ground-plane antenna. HMQ spent his vacation in Colorado and Idaho. QPM and SRL have HT-18 and Globe King. TGO and IVY are busy at the College of Puget Sound. LEC is on 10-meter phone. BA spent three weeks in Hawaii visiting KH6AHQ. KZP used a 4-watt portable for communications during a hunting trip. VI moved to a new location and finds the noise level down. JNC now works at KOMO-TV. OEX visited 6YH. OFB has a new location. SKT has new 10-meter final. Traffic: WTKT 625, PGY 574, BA 547, CZX 247, OE 151, FRU 106, APS 78, TH 77, FLX 67, RXH 66, EHH 64, FWD 48, UMK 46, AMC 32, QOU 28, RTQ 27, FTR 24, BG 23, QYN 22, AIB 18, JFC 17, LVB 12, BLX 10, BMK 10, SJL 10, ETO 7, ZU 5, GAT 4, EVW 3, NWP 3.

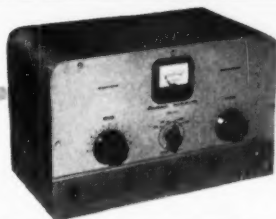
PACIFIC DIVISION

HAWAII—SCM, James E. Keefe, KH6KS—A new Hawaiian Island net has made its appearance on 7250 kc. and meets every Mon. and Wed. at 1545 HST. This net is spark-plugged by KH6AGB, ARM, AXS, AXH, and AN, and has traffic outlets to all outlying islands and to the mainland via W6TEG and W6FWL. Give the net your support. Vince, of KA4MC, made a stopover visit at KH6AJF on his way for reassignment at San Diego. Those making BPL this month are KA3AC, KH6AJF, KH6AHQ, and KH6FAA. Late reports for September were received from KA7RC and KG6FAA. Traffic: (Oct.) KA3AC 2757, KH6FAA 1157, KH6AHQ 877, KH6AJF 532. (Sept.) KA7RC 1657.

NEVADA—SCM, Ray T. Warner, W7JU—SEC: JJ, EUCs: KOA, LGS, NWU, OXX, TJY, VO, and ZT. OPS: JJO, ORS: MYF. New hams in the Las Vegas Area are TXL and VSP. TXL is doing fine work with his little Bandmaster on 80 meters. VSP, a wheelchair patient, is using a Viking on 40 meters. Drop in an ace him, gang. BJY made his 25 Nevada contacts on 40 meters and received certificate No. 14 for his efforts. NOW, of Reno, is active on 21 Mc. NRU splurged on a new V-37 vertical co-ax antenna. ZT and some of the Bay Area Mobiles again assisted in the "Nevada Day" celebration at Carson City. JU is enjoying his new NC183-D and Select-o-ject. PRM has TV'd his Viking-L. Fellows, drop a card regarding your activities and keep this column informed. Many stations are still writing in for Nevada contacts. 1BDI was personally conducted through the mighty Boulder (Hoover) Dam by JUO.

SANTA CLARA VALLEY—SCM, Roy I. Cousin, W6LZL—This is the time of year for nominations of new officers and it becomes necessary to carefully select the people who have the club interest at heart. GLD pulled his seven-element beam down for overhaul. QYO is back on 144 Mc. after being off for months. IUV is building a hand-switching mobile rig and also a grid dipper. NMV now is on 144 Mc. with a 6J6. HC is keeping busy on three nets, plus the Pacific Area Staff. YHM still is busy with his job but manages to get in a little time with the nets. NTQ is busy building a new beam, three elements on 28 Mc., two elements on 14 Mc. UTV, a new ORS, reports in with traffic

(Continued on page 54)



Heathkit AMATEUR TRANSMITTER KIT

MODEL AT-1

\$29⁵⁰

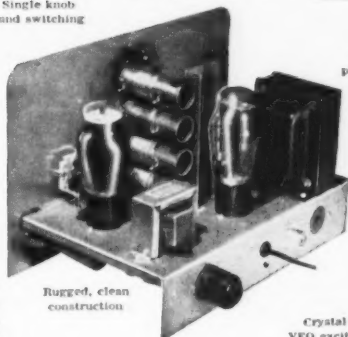
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6L6 Amplifier - Doubler
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105-125 volts AC 50/60 cycles 100
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VFO excitation

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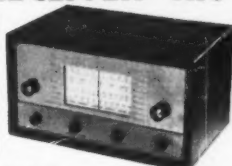
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12RA6.....IF amplifier
12AV6.....Detector - AVC - Audio
12BA6.....BFO oscillator
12A6.....Beam power output
5Y3GT.....Rectifier
105-125 volts AC 50/60 cycles
45 watts

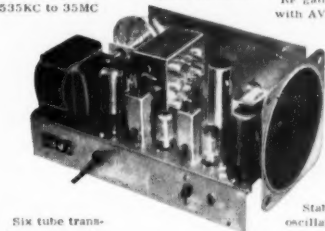


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net. Ship. wt. 5 lbs.
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standby switch

Stable BFO
oscillator circuit

5 1/2" PM speaker —
headphone jack

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- Transformer operated

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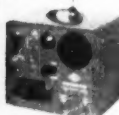
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and an NCS on PAN. OTS is interested in SHI's s.s.b. rig and is thinking of duplicating it. He is very enthusiastic about flying and soloed under the instruction of K6AQX. MMG reports CQA is a new ham in San Mateo. LHM reports a new shack is being built over the garage. LKY has a new 40-foot tower with off-center antenna. C.d. in Santa Clara County shows little activity at present as the State is status quo. A trailer is built and about ready for ham use in the c.d. effort. AEV reports the organizational meetings in San Mateo County are progressing very well and he hopes to have a smooth-working system soon. The SCCARA has started a little news letter called *The Junk Box*. Your SCM would like to take this opportunity to wish you a Happy New Year. Traffic: (Oct.) W6HC 183, TEK 78, FON 71, UTV 50, YHM 45, AIT 9, MMG 1 (Sept.) W6TEK 24.

EAST BAY — SCM, Ray H. Cornell, W6JZ — By setting up the National Traffic System, ARRL has provided the means for the systematic and rapid handling of traffic in the U. S. and Canada. The system is based on regular participation by many instead of just a few amateurs. Each can contribute in proportion to his ability and desire. There is room for newcomer and old-timer alike. If we can spare as much as one hour a week on a regular basis, here is an opportunity to contribute to one of the public services which justify our amateur radio privileges. For further information, drop me a line. DNX is going to town on the AREC in the Berkeley-Albany Area. He recently accepted the communications job on the Disaster Committee of the Berkeley Red Cross. The whereabouts and whifors of single sidebar were explained to the SARO by US UHM, and FAQ at the regular October meeting. Frank Roud, of c.d., was guest speaker at the EBRC November meeting. JZ spoke of the National Traffic System and of Pi-Network Finals at the Richmond Club Nov. 6th. BF spoke about Radiac Instruments to the So. Alameda County C.D. gang, Oct. 20th. EFD, HOR, and JZ are members of the Transcontinental Traffic Corps. HC, GGC and XYL, CTH, JZ, and FAX were among those attending the Southwestern Division Convention. K6AHV is a new QRS. K6BQV, the YL of IPW, received a new bug for his birthday. New officers of the Mt. Diablo Club are DEX, pres.; LIL, vice-pres.; YDI, secy.; LGW, treas. NXH maintained 40-meter phone contact with the East Bay gang while on vacation in Canada. K6GALE has a new (3) 8X28-A. He is a 40-meter DX fan. VCG told the Aeneas Radio Club about RTT on Oct. 14th. EEN is back on 3965-ke. mobile. East Bay members of AF MARS are HOR, MCM, HEN, NLM, TTT, GDM, LBB, QVI, QW, EEN, KPZ, and RTA. The NCDX Club reports a flurry of activity to work EA9DD in Rio de Oro. The lucky ones were TI, MEK, LW, and MX. QZZ, ASJ, and BM are newcomers to s.s.b. GIZ and PYH worked multiple operation in the DX 'phone contest. CGG is heard foolin' around with 20-meter 'phone occasionally. DUB and TT are active in c.d. circles. DUB has an FB mobile installation. PB is QRL business. HJE has a good article on a mobile antenna in the October issue of *The Carrier* (Mt. Diablo Club paper). DMA has acquired an XYL. K6BDF moved to Danville. OVO is in the service of Uncle Sam. K6DX has a 64-ft. tower. Traffic: W6IPW 301, JOH 70, JZ 56, YDI 6.

SAN FRANCISCO — SCM, Walter A. Buckley, W6GGC

— SFRC members and their friends enjoyed a Halloween Party at the Oct. meeting. An election was held prior to the dance. The following officers were elected: GGC, pres.; AAH, vice-pres.; URA, secy.; H. Witzke, treas.; GHI, KES, CTH, PHT, and BMY, board of governors. DEG was a speaker at the Oct. meeting of the HAMS. The Club had a 2-meter mobileade visit to the MCRC Nov. 13th. During the S.E.T. the northern and southern areas of the San Francisco section were alerted. SLY, EC of Humboldt County, and Sam Van Liew, NL, did a fine job. Conditions were poor but the publicity given the S.E.T. and the photographs published in the *lunar paper* gave people a clear concise idea of what the amateurs could do in case of an emergency. The SCRA held a Christmas Party Dec. 5th. The MARC holds its regular meetings the 3rd Fri. of each month. The TRC still meets at OZZ's QTH. The Club has no manpower for a trailer as yet. The CRC meets the 2nd Fri. of each month. The SFNSYC meets odd months at the Naval Shipyard, even months at the Natl. Red Cross Bldg. Mobiles: FXX, EBY, BMY, JK, TL, CDE, ACN, CTH, JZ, HC, SDN, K6BL, ELAW, YPM, NKP, and GGC all attended the ARRL Southwestern Division Convention. BMY, OAQ, LHV, BSE, NTU, AAO, MRV, ACN, BY, YPM, ISO, and GGC went to Carson City, Nev., and took care of parade communications. BMY was Net Control of mobiles. GGC held the fort at the auditorium. MRV transmitted from a roof top and AAQ stood by at the judges' stand and advised the judges of the number of each division. Congratulations to CQA on his CD Party success — s.s.b. 8712, phone 180 points, to new Novices K6BCT and K6GCTV, and to UEV and ANN on their coming event. ELY won a prize for the best mobile installation at the Convention in Los Angeles. CTH beat the Los Angeles boys, winning the 75-meter hunt. AWT is back from Europe and working former pals. DCH moved to Marin City. CTH procured DCH's Elmer 3L 10-meter beam. YIK is convalescing from a broken ankle suffered recently in an auto

(Continued on page 84)

W9IOP's "Second Op"

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NET PRICE \$100

Complete DX Operating Information at your finger tips means better results faster. Here on a single ingenious computer you can instantly read data on *every* country and amateur-recognized subdivision covering: prefix; great circle beam heading*; time and date at DX location*; air mail, first class and QSL card postage rates; international reply coupon exchange table; continent; DX zone; prefix-to-country translation; and QSL Bureau addresses. Included also is a log to indicate date of contact and receipt of QSL card for each country.

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Model SX-88 Amateur Net \$499.95

10" PM Speaker in matching Cabinet. 17 lbs. Net \$24.95



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accident. The car was demolished but YIK saved his mobile gear and is back on the air. YOT, of USMC, has invented a new code; all dots, no dashes. NAC's propagation prediction service for DX, centered on San Francisco, is now quite the deal. Happy hunting to all. RMG came through San Francisco from Europe en route to Japan, called on GGC, and had a chat with his friends on MTN. The Emergency Net in the Bay Area meets on 10:30 A.M. Sun. on 3900 kc. Let's all check in from the Bay Area. MTN now operates the c.w. net on 3680 kc. each night at 2000. DTW is Net Control. We enjoyed meeting Ed Handy. Traffic: K6FCT 817, W6SWP 183, GGC 48, PHT 30, ATO 6.

SACRAMENTO VALLEY—SCM, Harold L. Lucero, W6JDN—Asst. SCMs: Ronald G. Martin, 6ZF; William van de Kamp, 6CKV. SEC: AVZ, OBS: AKF, OMR, BTY, PAM: TYC. Following is an outline of the AREC in the Sacramento Valley as proposed by AVZ: ECs SLY, FKI, ANR, KTF, EXP, AYU, EKP, and JEQ; Asst. ECs IFO and NCV; and AREC members GOS, JDN, JKA, JVV, AVZ, MLU, and BHV. The Red Bluff Club sent an activity report. Officers of the Tehama County Radio Club are TMP, pres.; PYE, vice-pres.; SYY, secy.-treas. The Tehama Radio Club has moved to new quarters near Ground Observer Corps and has installed high-power 2-meter equipment for club use and as liaison frequency between Ground Observers, CAP, City and State Police, Red Cross, and Service groups. Re the license plates for call letters for the car: Hams will go to their local Dept. of Motor Vehicles, take bona fide amateur licenses with them and apply for plates. The fee is \$3.00 in addition to the regular fee and the new call plates will be issued on Jan. 1st or shortly after. ASI rebuilt kw. final with 250THs and now is fighting "talk-back" modulation transformer. TYC is active on the Mission Trail Net. NGG is visiting the McClellan Amateur Radio Society. DTW is a new MARS member. VUU rebuilt his Super-Pro. NJF is on 75 meters DXing while mobile north of Oroville. CDG is active in c.d. on 75 meters. VBI is active on the TVI committee. GHP is active in c.d. on 3992 kc. regularly. OAI is a new station at McClellan with a Collins KW. HIR has recovered from his recent illness and is back on 75 meters. GMH is mobile in north country. LZM is active in MARS and c.d. VYE is active on 75 meters in c.d. UAF is the frequency standard in Sacramento and is active in MARS. REP cleaned up the trouble in his 75-meter mobile. ICB is back in MARS and on 75 meters. AK has a new 20-meter beam with 1 to 1.1 ratio standing wave. NFH, on 75 meters with 20 watts, is active in MARS. UMK has a new NC-100 as a mobile receiver. EKI and MYT were heard playing chess on 75 meters. HTS has been an active NCS in MARS. ATN finished the new shack and VFO at the same time. W6NSDB passed his Technician Class exam. REF received a 25-w.p.m. certificate. MIW is looking for a new QTH and is microwaving these days. CLV is active early mornings on 40 meters with claims of good DX. CIS was in Bakersfield for a month with portable. JN keeps 75-meter phone schedule nightly. GDO is active with his mobile. GDE is mobiling on 10 and 75 meters with a new car. HSB is active in MARS. ZF is planning to use a TV 60-foot tower on an insulated base as a transmitting antenna because of a restrictive area. EOU sends a nice letter from Germany. IEO is active in the Mission Trail Net and OEN when at home. JRY is busy building a 20-meter beam. QJD is going mobile. The GERC of Chico holds meetings the 3rd Fri. of each month at Naval Reserve Building at Municipal Airport. EOU is operating s.s.b. at DLAE on 14,302 and 3799 kc. Antennas are Sterba curtain on 20 and "V" beam on 80 meters. Traffic: W6TYC 31, AVZ 23, REF 23, JDN 18, IEO 16, ILZ 6.

SAN JOAQUIN VALLEY—SCM, Edward L. Bewley, W6GIW—SEC: KRO, RM: EXH, IBDI, Vice-President of ARRL, and 6ATO, Vice-Director of the Pacific Division, visited the Stockton and Fresno Clubs, bringing the gang up to date on many current matters. TVI and civil defense were the two main topics of interest, with a strong recommendation of RACES. The Stockton Club now is meeting at COP, and is formulating plans for a first-class communications center. CQL, Tuolumne County EC, reports AREC membership in his area is 100 per cent. KRO has a new 100TH final and we will be hearing him on 75 meters. QUE and NYT are two more proud Viking owners. KN6CLK is a new ham in Stockton. He is 13 years old. YGZ is looking for company on 220 Mc. and may find it soon. The Greenview Club is working on some 220-Mc. gear. K6AAS purchased a TV set in order to prove he has no TVI. ADB reports there is no TVI in his home from his 300-watt final. Winner of the TARC transmitter hunt was KN6CNT, the youngest ham in the club. ADB and WPF had the transmitter in the brush along the San Joaquin River. PJF is looking for more participants in the YL Net, especially in the northern part of the section. Don't forget your traffic outlet. SJVN, on 3525 kc. at 1900. The Net can use more members. Traffic: W6MGP 25, TXM 25, GIW 19, EBL 16.

ROANOKE DIVISION

SOUTH CAROLINA—SCM, T. Hunter Wood, W1ANK—A meeting of South Carolina hams was held at Greenville on Oct. 18th sponsored by the Greenville Club. NJC, Greenville Club president, and DX, the SEC, presided.

(Continued on page 96)

A NEW MOBILE RECEIVER CONCEPT



SUPER-CEIVER

Super-ceiver,
a new Gonset development,
offers you mobile receiver performance
equal to that of a high-quality, fixed station communications receiver.

The Super-ceiver combination consists of three elements: HF tuning head, which may be a Super-Six or other standard, good quality converter, a control box and the all-important Model 3041 unit, the heart of the combination. The latter is actually a crystal controlled, superheterodyne receiver with input circuits fixed-tuned to the output frequency used for the average converter. (1430 kc for Super Six) When preceded by a converter, this input constitutes the first I.F. of a dual-conversion receiver and the high frequency used insures adequate image rejection. The second conversion to 265 kcs. provides a new high order of mobile receiver phone selectivity. Four, double tuned I.F. transformers provide highly desirable steep-shoulder and restricted band-pass selectivity characteristics. A highly stable voltage regulated BFO with adjustable pitch control permits CW or SSB reception. Manual

AF and RF gain controls, (and AVC) provide optimum, wide-range adjustment for strong or weak signals. The well-known Gonset noise clipper effectively copes with ignition interference. Between carrier, background noise suppression, (squelch) brings this new amateur unit into line with long established commercial practice. A well-filtered, vibrator power supply, (built in) also furnishes regulated voltage for the associated HF converter. This same supply may be used with either 6 or 12 volt input! PM speaker is mounted on the Model 3041 panel. A highly compact control head mounts RF and AF gain controls, also BFO and MUTING on-off switches. Four foot cables with connectors are supplied for easy interconnection of all three elements. Here in brief, is a description of the Gonset Super-ceiver combination, a new mobile receiver concept.

Six band operation, (10-11-15-20-40-75) when used with "Super Six".

"Finger-tip control" with remote control head 2" high to match Super-Six converter.

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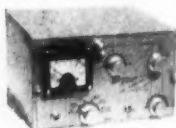
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with SEC DC, SCM ANK, PAM FHH, and RM UNO the principal speakers. Mobile operation was discussed and some 22 mobile rigs were present. The following mobiles reported into the Mobile Round at 1430 on 3630 kc. throughout October: ABW, ANK, ATL, BIZ, CAL, DX, DNW, HMG, LTF, NJG, NQP, NTD, NWE, NZK, OIZ, OSC, PLX, RTH, SZG, TPE, TSU, TWW, ULH, UPK, VFF, and ZVY. DX is building an amateur TV station and looking for contacts on the 420-Mc. band from Camden, S.C. FM has an emergency rig using BC-454 and BC-606 combination. ZVY has 812A modulated by 811s on 40 through 75 meters. In starting a new term as SCM, ANK appreciates your confidence and will do his best to serve you. Your support is solicited in keeping the SCM informed by monthly reports in order to fill this column with items of interest. The ARRL TV demonstration was conducted by ARRL Technical Assistant L. G. McCoy in Charleston on Oct. 28th with between 200 and 300 amateurs, servicemen and electronic engineers in attendance. Traffic: W4ANK 164, FM 1.

VIRGINIA — SCM, H. Edgar Lindauer, W1FF — Conditions under which the new net, VON, has been operating have been found to be unsatisfactory because of QRM from Loran so it has been moved to 1820 kc. Mon. through Fri., 1900 to 1930 EST. Net Mgr. is 6BVY/4. The signal of UHG has been sorely missed from steady net QNT but a change of job assignments to later night work forced Jack to bow to the inevitable. YZC can be heard regularly on VY doing a bang-up job as NCS. From the excellent manner in which he conducts the net one would hardly believe that only a year ago he struggled through that Novice ticket. The Bristol Amateur Radio Club has published the first issue of a monthly bulletin of local activities. Prexy THM and JGS deserve much credit for their efforts on the initial publication. YHD, whose fist can be heard regularly during contests at IMX, used his home station for a change during the holidays at Leesburg. Headquarters is to be congratulated on keeping LAW on the air after the fire. VQZ has installed his homemade clamp-tube modulator. PYN moved to a better campus location at Wm. and Mary using equipment loaned by alumnus NRO. YVO is a new ORS/OBS appointee. YQG, who is an M.D., has moved to Falls Church from Clover, S. C. ZEV advises that his attendance at V.P.E. will have only a slight effect on his ham activities. The Falls Church High School has been issued the call BRN. YZC is organizing a teen-age net with the hope of using 3680 kc. on Fri. at 2000 EST. More about VTY later. KX is NCS on EAN Thurs. and is piling up traffic totals. YE, VWS, and IYC made fine showings in the Frequency Measuring Test. VWS is the latest OO appointee. Traffic: (Oct.) W4KRR 398, KX 228, KFC 130, KJW 58, LW 24, LIE 7, SPL 5, LK 3, (Sept.) W4ZEV 103, RJW 84, NV 71, WAG 35, CFV 25, JAU 22, TYC 20, UHG 20, TFZ 12, PYN 10, LW 9, GR 8, SHJ 6, W6FMZ/4 4, W4LK 3.

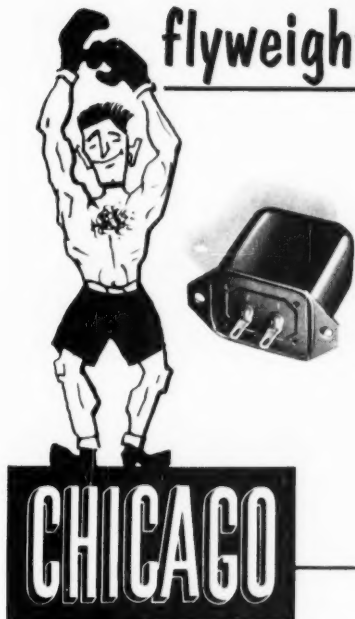
WEST VIRGINIA — SCM, Albert H. Hix, W8PQQ — SEC: YPR, RMs, DFC, GBF, AUJ, and IZA. QHG now is Asst. EC for Kanawha County, WNSOLS and WNSPBS are new hams in Weston. The Weston gang held a 6-meter simulated emergency test with five stations participating. New hams in Princeton are KVO, NAM, and NST. NGW, the new 8th district QSL Manager, requests that West Virginia hams send in their envelopes. IZH/ORT is new OBS and ORS. AUJ has the 500-watt rig about ready to go. YPR was disappointed SEC and will have a state emergency communication plan for distribution soon. The Tri-City Club showed an ARRL film on TVI at its Nov. 6th meeting. Welcome to E.T.B. from Ohio, now living in South Charleston. LSC returned from Brazil. HRN, IZA, CLX, and PQQ QSOd EA9DD in Rio de Oro. EOI finished two p-network 4-250A finals and is putting up new all-band antennas. Thanks to the many hams who assisted in the forest fire emergency. It's sure nice to hear DYB back on the net. Traffic: W8AUJ 145, ETE 70, IZA 58, DFC 39, GGC 16, GEP 14, MBA 12, LBT 11, PQQ 7.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, Karl Brueggeman, W0CDX — SEC: AEE, IC, AEE, SUP, and CDX traveled to La Junta to attend the Arkansas Valley Radio Club meeting. K1HQ took a much-needed vacation from work and traffic this month but now is back at it again. YCD is on the air from Eads, NCG has two schedules with Pensacola, Fla. IYC recently was bitten by a dog suspected of having rabies and spent two weeks in bed taking the Pasteur treatment. ZJO is getting back into traffic again. He had a good elk hunt and reports that GKN shot two deer with one shot. K0WBL now is on the air from the Rocky Mountain Arsenal. IVC is the trustee and the MARS call is being assigned. BWJ has weekly schedules with K3FAL at Biggs AFB in El Paso, Tex. and will handle any traffic he has or the Southwest on his sked. He also can contact the Rebel Net in Texas and New Mexico. Not much club news was received from around the State. Your SCM would appreciate much more news from all the clubs so that he can keep everyone in the section informed on what is going on. Also, what do you think of having a Colorado QSO Party with prizes? If we get a favorable comment, we'll schedule it. Traffic: K0FAM 368, W0KHQ 364, ZJO 257, BWJ 22.

(Continued on page 100)

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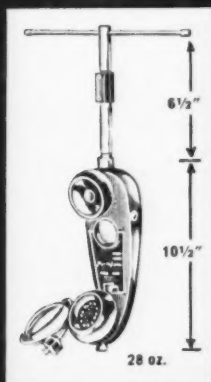
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(Continued from page 96)
UTAH—SCM, Floyd L. Hinshaw. WUTM—Always, there is something to distract the amateur. Now it is the deer season. IQP is busy campaigning for Town Councilman. Here's luck, Allan. TER now is with Western Air Lines in Salt Lake City. The Radio Institute in Salt Lake City has a new instructor in QOO. NXM has transferred to Los Angeles and his new call is K6CBK. CCC is back in the CD Parties and measured by his performance in the October Party. Utah should be well represented in the SS. MARS station AT7FCN is beginning an intensive training program, having just received new course-aids for teaching Novice through First-Class Commercial tickets. Traffic: W7UTM 21.

SOUTHEASTERN DIVISION

ALABAMA—Acting SCM, Jack D. Gray. WISXS—VON has a new antenna farm, with folded dipoles shading the shack. YDU is rebuilding and will have VFO, driver, and 813 final which he hopes will be TVI-proof. USB is on 75 meters occasionally. WYN, WYO and WYP are active on all bands. Tuscaloosa now has an active club. BWJ is active at the Naval Reserve Armory in Tuscaloosa. RLG, TXM, TOG, WJX, VDL, and YAI are active on the Fri. morning Southern Belle Net. WN4CFZ, the XYL of ZMK, and WN4WF, XYL of SUF, are new hams in Anniston. VDK now boasts a General Class license and can compete with the XYL, VDL, AUP and GMIH are on the sick list. WN4YYJ, the XYL of ARR, is working on General Class license. KIX is doing a noble job as RM on AENB. EBD is working on mobile in the new Chevy. The Montgomery auxiliary put on an FB hamburger supper and the Birmingham Club did likewise with a hot-dog supper. The Tusca Club entertained members with a hot-dog supper. WYN is building a 100-watt 2-meter rig. SXs is DX happy. HCV and FSW are active on 2 meters. TLY is on 2 meters occasionally. MUU is on 75 meters once in a while. PWS is building a 20-meter vertical so he can work junior overseas. VRH has a new 40-meter rig. ERW is building a new rig. Gadsden is organizing a club. UJJ now is an Official Bulletin Station. Traffic: (Oct.) W4RNX 88, KIX 71, UJJ 62. (Sept.) W4UHA 361, (Aug.) W4CHA 148.

EASTERN FLORIDA—SCM, John W. Hollister, jr. W4FWZ—From Jacksonville to Key West everyone was in the October S.E.T. The nets did swell in the WX nets during the hurricanes. OOs should bear down on all infractions by amateurs as well as military stations using ham bands. Like PJU. I think it is time for us to try to clean it up. TAN, Bradenton EC, sent in his traffic score with apologies to PJU. UWW, of Sarasota, is critically ill in Kentucky. Clewiston. It's nice to have PJU back after his 10,000-mile trip around the country with his XYL. Fort Lauderdale: Congrats to MLS at AB for working W2ZXM/mm. *Flying Enterprise II*. YOX challenges anyone to outdo him as a long-winded QSO'er. Jacksonville: The JARS had a nice traffic booth at 50th Aviation Celebration, with UHY, WEO, HWA, TRN, and others pushing the stuff out. Key West: New club officers are AQJ, EJD, ZLI, ZBF, ANJ, and RNV. BCZ is campaigning for mayor. Lakeland: VIE says the club now is running code and theory classes. Miami: IEH reports that the Flamingo Net issues certificates for working 5 net members. Eighteen mobiles went after the prize in their latest night-time hidden transmitter hunt. MVR copped it in 45 minutes. IYT and IEH say to look for the Florida gang on 7105 kc. at 10 A.M. Sun. IEH is using grounded grid linear with parallel 805s running 800-watt peak, usually on 3995 kc. after midnight. The Dade Club had a real talk on flying saucers by a staff member at WTVJ. The Flemingo Net has 54 members. IYV is busy with the club TVI committee. Thanks for all the reports, fellows. Traffic: (Oct.) W4DVR 337, PJU 324, LDM/KZT 281, DRD 212, SVX 157, HWA 120, GZV 97, IYT 95, PZT 84, ZIR 84, LMT 72, KJ 69, IM 49, VIE 42, FWZ 41, LUV 23, TAS 18, TWR 8, WEM 6, DES 5, FKR 5, ZBF 2, TYE 1. (Sept.) W4AMT 26, (July) W4PJU 94.

WESTERN FLORIDA—SCM, Edward J. Collins. W4MS/RE—Acting SEC: NN. PLE is temporarily operating K1Z. WN4BGG is working DX with a new NC-88 receiver. CCY is going to try 20 meters. RZV still is a wheel in the Dagwood Net. NOX keeps Pensy going in the Gulf Coast Hurricane Net. CNK and EQR are renewing their tickets. FHQ is getting the 144-Mc. bug again. AXP was in W3-Land. IREV/4 keeps skeeds with the folks up "Nawth." NJB is getting the new shack fixed up. ZFL is giving 'phone a whirl. YRE is trying for DX. VR keeps 7-Mc. c.w. going. PQW has been servicing deep-sea electronic gear. PTR is heard mostly mobile. TTM keeps 75 meters alive. SZH says he now has the perfect rig. ERR is the teletype man. UCY is watching 10 meters. HJA has been ill but is OK now. UNW/VO6 is looking for the Western Florida gang. BFD is finding the "wee sma" hours better on 20 meters. With the opening of Pensy's TV station, WPFA-TV, on Channel 15, MS, acting for the TVI committee, has found that the TVI problem isn't near what the gang at the QSO. QRL is QRL, a new son. WN4ZEN is going after that General Class license. AYS is trying 144 Mc. Happy New Year, gang.

GEORGIA—SCM, James P. Born, jr. W4ZD—SEC: NS. PAM: LXE. RM: MTS. Nets: GCEN on 3995 kc. at

(Continued on page 108)



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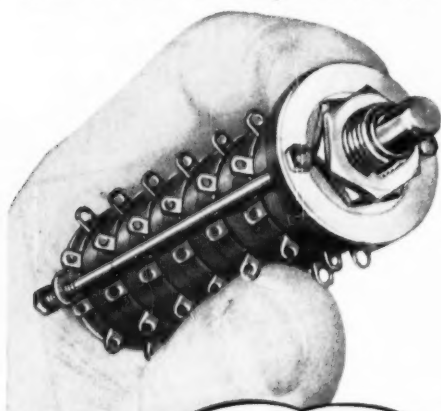
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1900 EST on Tue, and Thurs., 0830 EST on Sun.; ATICW on 7150 kc. at 2100 EST Sun. State mobile and c.d. frequencies: 3995 kc. and 29,600 kc. LRR is NCS of the Atlanta Two-Meter 'Phone Net, which meets at 2030 EST on Mon. on 144,138 kc. The North Georgia College Radio Club held open house and field day at its shack near the college called "Radar Ridge." The Club has a lot of u.h.f. and v.h.f. gear on the lower ham frequencies. PYM is interested in making schedules with stations interested in u.h.f. and v.h.f. work. LING has a new 50-Mc. beam. The hams at the Georgia Military College at Milledgeville have organized a radio club and will have the club station in operation soon. RJY has moved to Atlanta from Carrollton. VSW is building a 4E27 final for all bands. Congratulations to K4WAR and W4USA, who made BPL this month with FB traffic totals. IMQ is recovering from an operation. Good luck, Jim, on a speedy recovery. NS is the new Section Emergency Coordinator for Georgia. All ECs, please send your monthly reports to NS at 226 Kings Highway, Decatur, Ga. Traffic: W4USA 2247, K4WAR 1484, W4OCG 104, ZD 102, HYW 42, MA 29, YMV 29, MTS 19.

WEST INDIES—SCM, William Werner, KP4DJ—SECs: KP4HZ, KV4BD. KV4BD makes BPL with 600 messages handled on Vinet at 1130, 1630, and 2330 GMT daily on 3895 and 7205 kc. Some of the traffic handled was for IDRA, the schooner *Treasa* carrying a Marine Scientific Expedition from Germany to St. Lucia, B.W.I. HZ tested his new Heath AT-1 transmitter on 3505 kc. with KD and DJ. TP installed Elmac mobile in the car, operating 75- and 20-meter 'phone. RC, San Juan EC, has a new HT-9 for 80 and 75 meters. TO is the P.R. link of the Vinet. The Colegio San Jose R.C. elected PD as president. W2QHH received WPLC-25th sticker. The National Guard's amateur station is WAC, RL, DV, and WE took part in the September Frequency Measuring Test. RL averaged 99.88 per cent accuracy. K2CNI now is KP4YI in Rio Piedras. UK has an 80-meter antenna. MV is handling 'phone-patch traffic for Vinet. MO put up a three-element 15-meter beam. UW really has complete break-in, using the same antenna for transmit-receive. WI and WW, both named James, were W3TK and W5TUK. VP2KG in the Presbyterian Hospital in San Juan wants KP4 visitors. MS has been bitten by hi-fi. RD has a brand-new oscilloscope to watch modulation. AZ has a new 4-125 final amplifier. BV reports into the AREC Nets—AREC Net 3550 Kc. Mon., 8 p.m.; AREC Net 3925 kc. Wed., 8 p.m.; AREC Net 28.8 Mc. Fri., 8 p.m. VH is the Ground Wave cartoonist. Traffic: KV4BD 606, KP4DJ 23, RC 13, RK 8, WP4VH 3.

SOUTHWESTERN DIVISION

LOS ANGELES—SCM, Howard C. Bellman, W6YVJ—SEC: QJW. RMs: BHG, GJP. CK is thinking about accepting the PAM job. On Nov. 2nd your SCM made a visit to the Glen-Area Net. The outcome of the meeting after a talk by an ARC representative was 100 per cent cooperation with the Red Cross. QJW, your SEC, reports 825 members of the AREC to date. Heard also reports that VBN, MDX, and CQV are operating mobile from Colorado River fishing spot. MDX will become a W7 in February. KOS, KLR, and MYC are new ECs. RW needs an AC3. QS is a new member of the 50 Club. LZS has moved to North Hollywood. K6CCZ, in Sunnymead, writes that he is ex-W7LQN, A14AO (MARS APO 74). He operates 75, 80, 40, 20, 15, 11, and 10 meters, c.w. and 'phone. TRF sounds like a newcomer to LSN. BHG's company is on strike, which makes him available on LSN every night. Also heard on LSN are ISQ and JYE. Oct. 11th found a gang of more than 25 at Clinton's having it out at the Southwestern Division Convention Traffic Breakfast with KGC presiding. 1BDJ graced the meeting, along with SCMs JZ, East Bay; GGS, San Francisco; and YVJ, Los Angeles. HIZ, president of M.T.N., richly gave of his valued advice. Others present included dyed-in-the-wool traffic men like CMN, HIF, FMJ, QYH, HC, ESR, BHG, FNE, GJP, ELQ, DDE/FAE, IZG, IAB/NYB, LI, KGC, GTH, EJY, ROP, and others who got away before their names could be taken. A monthly meeting was suggested and approved by those present to further inter-net traffic and good fellowship. ROP was asked to notify those present when arrangements were made for the first meeting. NTN is enjoying life more now, filling out his ham hobby with traffic plus building test gear, OBS, and EC. CAK reports new radio classes starting Nov. 24th; one for Novices and one for General Class, at John Burroughs Jr. High. CK thinks F.M.T. is a guessing game. RES is ORS again and has 100 watts 80 through 10 and is mobile on 10 meters. MBA finally got his ORS certificate. Off on a trip to Mt. Pacific were NJU, KPM, HIL, QXY, TJL, TJL, QHS, SQY, and BFD of the Pacifico Club. K6BAG. NTE has been on the air once a day since becoming licensed in 1961. SML is operating 160 through 20 meters. New Asst. SECs are HKD and KSK. KLR, Big Pine, is head of the Eastern Sierra Net and EC. Traffic: (Oct.) K6FCA 1965, FCY 1508, W6KYV 873, HIZ 382, LYG 205, K6BVH 76, BWD 76, W6JQB 71, BHG 69, K6CCZ 51, W6CMN 48, MBA 47, CAK 23, GJP 11, TRF 10, AM 8, OKD 8, COZ 7, HIF 6, NTN 6, BES 4, BLY 3, CBO 2, CK 2, SML 2, NJU 1, W6HAW 6 1/2 (Sept.) K6FCY 5256, W6DDE 264, K6BWD 102, W6CAK

(Continued on page 104)

Happy New Year

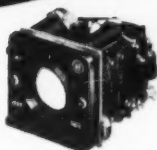
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*Bill Harrison, W2AVA
and the Gang*

**Timely Ham Suggestions to
Start the New Year Right**

NEW MILLEN MINIATURE SCOPE

- Miniaturized - 1"
- Panel Mounting
- Instrumentation Use



Only 2-3/4" square by 4-5/8" L! Excellent for modulation monitoring, FSK, plus a wide variety of monitoring applications in place of usual panel instruments. Uses new ICPI CRT. Equipped with intensity and centering controls, but has no amplifier, sweep or power supply. Horizontal and deflection sources, and heater and acceleration voltages taken from equipment monitored.

Millen Model 90901. With scope tube \$33.90
Same as above, less scope tube \$21.00

ELMAC 6-BAND RECEIVER

10-tube dual conversion receiver covers 160 meters and broadcast, 80, 75, 40, 20, 15 and 10 meters. 10 tuned circuits provides high selectivity. Built-in noise limiter and BFO. Requires 6VAC or DC at 3.3A; 250VDC at 90 ma. 4 1/2 x 6 1/2" D. Model PMR-6A \$134.50

NEW ELMAC TRANS-CITER

For under-dash mobile or fixed station use as exciter, speech amplifier, VFO, driver, or a complete low powered xmitter. Single control bandwitches all stages simultaneously from 160 thru 10 meters on 7 bands. VFO or crystal control. 60 watts input. For 6V or 12V AC or DC. Use with supply delivering 350 to 500V. With 10 tubes 1 1/2 x 7 x 8 1/2" D. Model AF-67 \$177.00

COLLINS 75A3 RECEIVER

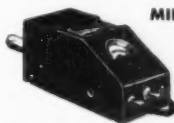


Featuring sensational Collins mechanical filter. Gives a practically straight-side, flat-topped selectivity curve! Plug-in provision for two mechanical filters. 3 kc filter standard. 800 cycle plug-in unit available as optional accessory for greater selectivity on CW. Double conversion superhet covers 160 thru 10 meter bands. Less speaker \$530.00



COLLINS 32V3 TRANSMITTER

The most wanted of all medium power transmitters! Compact, VFO controlled, gang-tuned unit with complete bandswitching. 150 watts input on CW, 120 watts on phone. Covers all ham bands: 80 thru 10 meters \$775.00



MILLEN GRID DIP METER

Compact and self-contained instrument with built-in transformer type AC power supply and internal terminal board to provide connections for battery operation. Range: 1.7 to 300 mc on 7 direct reading bands. No. 90651 \$61.50

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304TL \$4.95 **100TH \$7.95** **814 \$2.75** **826 \$5.50**

TUBE	NET
1B3GT	7.06
1L4	.70
1R5	.94
1R5	.98
1S4	.82
1S5	.90
1T4	.90
1U4	.90
1U5	.80
1X2A	1.06
3Q5GT	1.12
3S4	.88
3V4	.70
5U4G	.56
5Y3GT	1.34
6AC7	1.36
6AN6	1.56
6AK5	1.74
6AL5	.72
6AQ5	.90
6AG5	.90
6AT6	.66
6AU6	.66
6AV6	1.28
6BA6	.78
6BC5	.80
6BE6	.82
6BG6G	2.10
6BH6	.72
6BJ6	.84
6BL7G	1.16
6BQ6GT	1.52
6BQ7A	1.40
6BK7	1.28
6C4	.68
6C5	.78
6CB6	.84
6CD6G	2.36
6H6	.72
6J5GT	1.00
6J6	1.00
6K6GT	.72
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6T8	1.16
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6W4GT	.76
6W6GT	.88

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15 SET SCREW KNOBS



Per Kit **\$129**
Stock No. 99-08K15

Popular assortment, Wt. 2 lbs. In utility box.

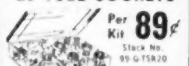
100 INSULATED RESISTORS



Per Kit **\$299**
Stock No. 99-08R100

RMA color coded 1/2, 1 and 2 watt sizes. Popular assortment, in plastic utility box, reg. list \$15.80! Wt. 2 lbs.

20 TUBE SOCKETS



Per Kit **\$89**
Stock No. 99-08T20

Including MIFs, miniature, wafer, lactal, etc. In utility box Wt. 2 lbs.

8 XMTG MICAS



Per Kit **\$189**
Stock No. 99-08MC8

Valuable assortment, 1000 to 5000 V DC. Fine for experimental or ham gear use. In plastic utility box Wt. 1 1/2 lbs.

TUBE	NET
6X5GT	.62
12A16	.66
12A17	1.16
12A16	.74
12A17	.96
12BA6	.78
12BE6	.82
12BH7	1.10
12SN7GT	.92
19R6G6	2.40
19T8	1.16
25B6GT	1.56
25L6GT	.78
35B5	.84
35C5	.82
35L6GT	.78
35W4	.54
35Z5	.56
50B5	.84
50C5	.82
50L6GT	.78

TUBE	NET
810	13.50
811A	3.25
811	2.95
812A	5.00
812	5.00
814	5.25
815	3.70
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805 \$3.95 **304TH \$3.95** **866A \$1.15**

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72, CK 10. (Aug.) K6FCY 1990. (July) K6FCY 1505.

ARIZONA — SCM, Albert H. Steinbrecher, W7LVR — The ARFC group of the AARC staged an emergency test for mobiles in cooperation with the City and County Civil Defense in Phoenix. Mobiles were dispatched from an emergency-powered portable control station (W7JYH) and were assigned to be on the alert for sabotage activities. The following mobiles participated: BHM, IRX, KOY, MAE, MWD, N.G.J., OQS, OUE, PMQ, QZH, and RLI. The Southwestern Convention in Los Angeles was attended by GYK, LVR, OAS, and SX. Another transmitter hunt was staged in Tucson with LVR and HUV as the hidden transmitter. Mobiles and fixed stations operated by AIA, DRQ, PEG, PLM, QHD, and QHT attempted to find it but gave up after two hours of search. The Arizona State Fair in Phoenix is using mobiles spotted around the track for safety at the Jalopy Races, and the following have volunteered: IRX, JYH, MAE, MDM, PUP, and QZH. The Arizona Highway Department (Tucson) staged a "Drag Race" and the communications were handled by DRQ, MOI, PLM, QHD, and QHT. OPRC is starting a series of illustrated lectures on Radio Fundamentals, headed by PEG. KWB and PKM have new Vikings. KWB will be on 40-meter teletype and is looking for interested parties. TDL, TNJ, and UPQ are on 75-meter phone. SK is 75-meter mobile. NZB moved to Flagstaff. Traffic: W7KOY 106, LAD 69, LVR 32, IRX 24, PKM 13, HUV 2.

SAN DIEGO — SCM, Edgar J. Cameron, Jr., W6FJH — Asst. SCM's Thomas H. Wells, 6EWI; Shelley S. Trotter, GRAM; Richard E. Huddleston, 6DLN; SEC: VFT, Asst. SEC's: FOP, WYA, EDCs: DEY, HRI, QJH, SK, PAM; JFM. Yours truly attended the ARRL Southwestern Division convention in Los Angeles in October and had pleasant ragchews with Ed Handy, Bill Greenfield of FCC, the Arizona SCM, Al Steinbrecher, NYB, ex-chief operator at IAB, and a chap visiting from ZL-Land. It was nice seeing KW, our Director, and meeting Vice-Director EKM. The Convention attracted quite a sizeable turnout, the banquet was superb, and there must have been 5000 prizes but I did not win one of 'em (as is usually the case). LZG has a 9-watt phone rig doing great on three c.d. nets. QRM has been helping ARY call the northern San Diego ARRL roll-call lately. The boys at IAC are planning to have two separate shacks on the high school campus soon, one for General Class men and the other for the Novices. GDG's rhombic is bigger than ever now! QBN is back on the air with 40 watts and VFO (strictly c.w., of course). W6s BKZ, SK, and FOP visited the last monthly meeting of the Palomar Club. The Palomar bunch is trying to get back its former club call. CAE is beating the TVI monster slowly but surely. KG6AEP-6 is a new Class I OO in these parts. ORD is giving out with FB bulletins and is active on the TVI committee. The high school club, IAC, has a brand-new NC-125. Watch those kids go now! UJO now has a VFO. Traffic: (Oct.) W6LZG 82, IAC 9, KVB 4, (Sept.) W6ELQ 4.

SANTA BARBARA — SCM, Vincent J. Haggerty, W6UOX — Regular reporter K6NBI heads the traffic men in the section this month. QJW reports the Santa Barbara Net (SBN) is progressing well. FYW reports the Paso Robles 2-meter gang members are all on 145.3 Mc, with plenty of activity. K6ASB is active on SBN. OXJ is QRL with school work but finds time for amateur radio, too. Glad to report that LB is off the sick list. IHD is active on the TRICO and Buzzards Nets and has a new antenna working. LKF and LDF held a 2-meter mobile QSO between King City and Yosemite Park. Two-way 2-meter contacts from Santa Maria across the mountains to Paso Robles and Atascadero are reported. Traffic: K6NBI 61, W6QIW 28, FYW 11, K6ASB 6, W6OXJ 3.

WEST GULF DIVISION

NORTHERN TEXAS — SCM, T. Bruce Craig, W5JQD — SEC: RRM, PAM, IWQ, RMs: PCN, QHL. Please note that the new SEC is Cecil C. Cunnack, RRM, 3750 Brighton Rd., Fort Worth, Tex. Thanks to QHL for the work he did as SEC. The Waco Club announces that the ladies have formed an XYL Club, with Mrs. Doc Weaver as president. The Plainview Club reports hidden transmitter hunts. MHH has begun classes biweekly. YQD was burned out. The Club held an S.E.T. with a picnic supper afterward. GF has a Collins 303 on 40 meters. YUN is back in the Air Forces. UKE has been transferred to San Antonio. QVF is going back to New York. BHW is the XYL of TBH. This call antedates Ed's original call of 0BKA. Amateur Day at the State Fair proved to be a big success. The Fort Worth Kiloeye Club continues to get good publicity in the newspaper and on TV. LIE reports openings on 6 meters. LIE is experimenting with 420 Mc. YIM wants to know about 2-meter activity around Dallas. The Blue Ridge Net, which operates on 160 meters at 8 a.m. Sun., is 2 1/2 years old and has 15 members, 8 of them charter and 4 mobile. MHP is secretary. New Novices in Amarillo are BHP, BRQ, and RWY. 10-meter nets are springing up in cities all over the Northern Texas section. INM/mobile is being heard all over Western Texas on 75 meters. Traffic: (Oct.) K5FVB 1066, W5FB 924, LVC 268, PAK 146, LFF 80, PCN 52, CF 26, MBP 24, JQD 21, (Sept.) W5TFB 621.

OKLAHOMA — SCM, Jesse M. Langford, W6GAV — (Continued on page 106)

TWO NEW STANDARDS

FOR AMATEUR MOBILE RECEPTION

MORROW

FTR

MORROW
5BR-1



Discriminating amateurs throughout the world are using more and more MORROW Converters because they recognize the economy and dependability afforded by these superior units. Constant research and quality-manufacturing have combined to produce in the MORROW 5BR series a mobile converter of unsurpassable amateur band performance. You can't beat their rugged durability and reliable operation. Dollar for dollar MORROW Converters are better because they are designed better, employ higher quality components and are manufactured with more care. Note these features:

1. IMPROVED SIGNAL/NOISE ratio obtained through use of Hi "Q" coils on Poly forms and high gain circuitry.
 2. EXCEPTIONAL STABILITY assured by Temperature Compensated Clapp Osc. and Mixer.
 3. THREE GANG TUNING and SEPARATE COILS for each of the 5 bands in RF, Mixer and Osc. sections virtually eliminates images and birdies.
 4. BDCST TRAP built in to prevent break-through at IF frequency.
 5. CALIBRATION ACCURACY ASSURED, with oscillator coils permeability adjusted, and maintained over wide temperature variations by O temp trimmers and compensating paddlers.
 6. EXCELLENT BANDSPREAD on large, easy to read dial, spreads each band across the entire scale. Covers: 3.5-4.0, 7.0-7.3, 14.0-14.35, 21.0-21.45 and 28.0-29.7 Mcs.
 7. MORROW NOISE LIMITER effectively reduces ignition and external pulse type noise.
 8. DUAL DOUBLE-TUNED IF AMP affords good selectivity and accurate reset capability when used with auto radios. Output freq: 1525 Kcs.
 9. SSB RECEPTION obtainable when used in conjunction with new MORROW FTR receiver.
 10. LESS INSTALLATION FUSS, merely plugs in for all connections when used with FTR receiver.
- Complete with mounting hardware, connecting cables and instruction manual for easy installation. Dimensions: H:4", W:5 5/8", D:7".

We predict the new MORROW FTR receiver will establish a new standard for mobile amateur communications. The FTR is engineered to achieve the optimum in stability, sensitivity and selectivity, comparable to the finest communications receiver. The ten tube circuit features 15 tube performance and is designed to replace the auto radio as a companion unit for the MORROW or any other converter with output between 1400 and 1600 Kcs.

Electrically the FTR is a crystal controlled, fixed tuned superhetrodyne combining time-proven circuits with many exclusive MORROW engineering accomplishments. The use of high quality components and materials, the excellent construction and the multi-purpose tubes in the FTR assures an initial and continued high degree of performance characteristics. The new receiver's compact size and multiple functions offer amateurs exceptional versatility of installation and operation. Here are the specifications:

HIGH SENSITIVITY is less than 1 mv when used with the MORROW or other good quality converter.

SHARP SKIRT SELECTIVITY of 3.0 Kcs. bandwidth is obtained with 200 Kc. IF amp.

EXTREME STABILITY is sufficient for good SSB reception. Silver mica or temperature compensating condensers in all LC circuits. Resistors and ceramic condensers are mounted on terminal boards.

HERMETICALLY SEALED "5" METER operated by built-in VTVM in both AVC and Manual positions. Meter also used as FIELD STRENGTH METER for adjusting transmitter to maximum output.

SERIES NOISE SILENCER effectively suppresses pulse noise such as ignition interference.

ADJUSTABLE SQUELCH CIRCUIT that responds only to signals, never to noise alone.

THREE STAGE AUDIO amplifier affords ample loudspeaker volume even on weak signals.

Complete with separate power supply, connecting cables, mounting hardware and instruction book. Dimensions: H: 4", W: 5 5/8", D: 7". Optional equipment: Model SH, 5" heavy duty PM speaker in cast aluminum case with universal mounting bracket.



MORROW TOP HAT

Mounts above loading coil of any standard whip antenna. Greater antenna efficiency.

\$2.50 Amateur Net



MORROW GC10 & GC20

Tuned Generator Noise Filters for 28 or 14 Mcs. Tune for minimum hash level in receiver.

\$3.75 Amateur Net

5BR-1 with built-in noise limiter	\$ 74.95
5BR-1N-1 less noise limiter	\$ 69.95
5BRF designed specifically for new FTR	\$ 67.95

FTR RECEIVER

(Including Federal Excise Tax) \$128.40

SH 5 in. PM heavy duty speaker with case \$ 7.30

Prices Amateur Net



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will not cause disruption of an urgent military project.

Asst. SCM: Ray A. Thacker, 5TFP, SEC: CKQ, RM: MQI. PAMs: SVR and ROZ. Mr. A. L. Budlong, 1BUD, ARRL General Manager, was in Oklahoma during October for meetings with the CAA Radio Club at Oklahoma City and the Tulsa Radio Club. Lots of information regarding League affairs was given to the Oklahoma gang and the personal contact with Headquarters was appreciated by all. The dinner in Oklahoma City, sponsored by the CAA Club, will be attended by Director Middleton and he also will hold a meeting in Tulsa before the dinner. CKQ is now SEC taking the place of AGM, who had to give up the appointment because of the pressure of business. MFX has a new antenna pole. OQB now is in Goltzy. Those who can, should check into the Sooner Sooner Net. K5FOM now is active on the amateur bands and with MARS. OFG reports school at O.U. progressing in fine shape. TNW is having receiver trouble. NGE has a new 20-meter beam. GVS is active on 75-meter phone. OWG now is EC for Ardmore. JP has a new transmitter on the air. WSQ is active in the NTO Net. LWG is rebuilding the rig. RST is a new grandpa. KY assisted the Kansas gang during the recent snow and sleet storm. VEP is on 2 meters. Mobile and v.h.f. activity has been at an all-time high in the section this summer and fall. Traffic: W5KY 101, MQI 90, MRK 86, MFX 73, VEP 62, PML 40, GVV 38, SWJ 34, TKE 33, TFP 31, EHC 30, SVR 29, GVS 26, WSQ 26, FEC 23, ADC 21, YGO 18, ITF 16, RST 11, VAX 10, VBG 8, TLL 2.

SOUTHERN TEXAS — SCM, Dr. Charles Fernaglich, W5JFF — JQ still is active on 40-meter c.w. using a vertical antenna. ULN, Asst. SEC for low frequencies, is on 75 meters. He is story-teller of the GCARC and is active in MARS. New members of the GCARC are 4TUN, 5BPY, 5WXJ, and FED. BGR is mobile on 75 meters with a Gonet and a Harvey Wells. He has a TV Buster, 300 watts on 20, 40, and 80 meters. JRV has no TVI with 700 watts on 15 meters. OGG is mobile. TOM is on the air but not heard very much. ULN can be found on 3824, 3885, and 3960 kc. ULW still is on when school and code classes permit. VLS has a new rig with 400 watts. QJD moved to Texas City and has no place for his big rig. Therefore, Sarge has 400 watts. WVI worked a VK6 on 40 meters with 400 watts. W5WYK is plugging for 13 w.p.m. WXJ recently worked ZL, CPI, CE, PY, CO and CM on 20 and 40 meters. YBL has a 75-meter vertical and also a mobile. FJF, who is a candidate for Director of the West Gulf Division, was asked to attend the AREC Handoff in Oklahoma City recently. He and OGC, SDA, RFW, and FEK attended and had a very nice time. They drove up in Doc's car and operated mobile all the way, making many nice contacts with 75 watts to an ART-13. FJF gave a talk on fellowship that caused a lot of favorable comment. FEK, SEC for v.h.f., gave a report on v.h.f. activities in Southern Texas. I received my copy of *Gutter Dope*, the publication of the

ARC. Mary is the editor and does a bang-up job. Meetings are interesting with good programs and the Club has a ladies' auxiliary. HHO worked frantically to get his mobile on. TSE and LFG have moved into a new home. SARC has regular transmitter hunts. URU has a potent signal on 75 meters with his mobile but is much better on 40 meters with his fixed rig. KBU is doing a nice job as NCS for STEN. He has a lot of good help from QEM, FIW, TVK, ONG, RWX, MMO, JN, RYZ, LVE, PTH, ORG, OKI, KSW, YJB, EZD, NLS, QDH, LUP, REM, BE, GWA, ARQ, and PY. RID handled emergency traffic from VP5BH on 40 meters recently. A British West Indian Airways Airliner made an emergency landing and had no radio. RID and BH prevented an extensive search-rescue operation. Traffic: W5MN 1885.

NEW MEXICO — SCM, G. Merton Sayre, W5ZU — SEC, MYL. PAM: BIW. RM: NKG. On Oct. 25th 22 mobile operators organized the Amateur Radio Caravan 'by of New Mexico at Albuquerque with the following officers: NSN, caravan master; PDY, emerg. car. master; PSU, secy.-treas.; WRS prog. dir.; JXO, asst. prog. dir. The asst. caravan masters will coordinate mobile activity on a local community level. Silver City has put in a bid for the New Mexico State Ham Picnic for next spring. CEE has a new Matchbox and checks into the Early Bird Net on 3845 kc. at 0900. SQT has a Viking II and end-fed 'V' beam. FPH now OES, acts as NCS of Albuquerque V.H.F. Net. UWA is new Albuquerque Area EC. BAG is new OBS and KL7AIY/5 is OES. CA has a new 6146 rig on 144.72 Mc. PSP finally got his Viking back. RFF now is building 220-Mc. gear. WVA, UQA, and AUW are going on 144 Mc. MYM is active from T/C. AK is in the Vet's Hospital in Albuquerque. SUY is getting c.d. communications lined up in his area. K5NRX made BPL. AKR helped install a TV transmitter on Sandia Crest. W5GBZ and W5GBZ are the latest Novices in Roswell. Your SCM visited the Tularosa Valley Amateur Radio Club on Oct. 14th and Sandia Base on Oct. 25th. Traffic: K5NRX 351, W5NKG 107, ZU 74, NUN 61, CEE 38, WPA 28, JZT 25, SQT 25, BIW 24, K5FAB 19, W5WYG 17, RPK 15, GEM 13, VHW 13, LET 11, OIA 9, UTS 9, VTB 9, WBC 7, ZGG 7, RFF 2.

CANADIAN DIVISION

MARITIME — SCM, A. M. Crowell, VE1DQ — VOGN and VOGH have been checking into the Maritime Net. New
(Continued on page 108)

HARVEY ALWAYS HAS IT...IN STOCK For IMMEDIATE DELIVERY

HAMMARLUND Model HQ-140-X COMMUNICATIONS RECEIVER



A new type superheterodyne receiver with built-in power supply for 115-volt AC operation, 50-60 cycles. Covers from 340 kc through 31 mc, in 6 bands. Has band-spread available for the 4 higher frequency ranges, with direct calibration for 80, 40, 20, 15, and 10 meter bands. Other features include: Antenna Compensator—S-Meter—6-position Crystal Filter—AVC—Noise Limiter—Stable BFO for CW—Audio Output approx. 3 watts—High Sensitivity—Standby-Receive Switch and Relay Connections.

Complete with tubes,
but less speaker **\$264.50**
Speaker in cabinet to match **14.50**

Model 5P-600-JX Receiver **\$1075.00**

The New GONSET COMMUNICATOR II Built-in Adjustable Squelch and Ear-Phone Jack

An improved model of the popular Communicator, 2-meter station. Cabinet modified to include ventilating screens. Ideal for CD work because of squelch and automatic speaker muting when phones are plugged in. Has receiver dial light, on/off switch and built-in speaker, noise limiter and 19" whip. Takes crystal or carbon mike. Crystal control.

Complete with tubes (less crystal and mike) **\$229.50**

New UNICOM

Now Available

Receiver tunes 108 to 128 mc. Has self-contained power supplies for both 110 volt AC and 6 volt DC operation. Transmitter supplied with crystal for 22.8 mc.



Complete with tubes and built-in antenna **\$299.50**

Tower and Rooftop Antennas Available

IN STOCK
Immediate Delivery

Millen 1-inch SCOPE Model 90901



Complete with Tube.....**\$33.90**

NOTE: In view of the rapidly changing market conditions, all prices shown are subject to change without notice and are Net, F. O. B., New York City.

ELMAC Model AF-67 TRANS-CITER

A combination exciter, speech amplifier, VFO, driver, and low powered transmitter. Suitable for mobile or fixed-location operation. Covers 7 amateur bands: 160 through 10 meters. Single control band-switches all stages simultaneously. Built-in VFO. Untuned crystal oscillator uses any crystal with fundamental or harmonic of desired frequency. Operates AM, NBFM, or CW. Has coaxial output connector with Universal Pi Matching network. Has provision for 40 watts of audio at 500 ohms. Meters grid and plate circuits. Can be used from 6 or 12 volt AC-DC source. For maximum flexibility, requires high voltage supply: 500 volts @ 170 ma, and 225 volts @ 60 ma. Input 60 watts.



Complete with tubes and 15-prong power connector **\$177.00**

STEWART-WARNER PORTAFONE Model 73 Citizens 2-Way Radio

A lightweight, self-contained radio receiver and transmitter. Has a transmitting and receiving range from several hundred yards to several miles, depending upon terrain. The perfect communication system for the construction engineer, the surveyor, the TV service technician, and the many others in the need of inexpensive means for short range communication. Any U.S. citizen over 18 years of age can easily secure a license for this approved equipment. No technical knowledge required.



Portafone weighs only 28 ounces and fits comfortably into the hand. Power can be obtained from several supplies. The Portafone Handy Battery Pack is for portable use, and fits into the carrying case. The Portafone Central Station Power Pack is for use where 115 volt AC outlet is available. The Portafone Citizens Radio Power Pack is for use with automobile storage batteries. One Battery or Power Pack is required for each Portafone unit.

Portafone Model 73, per pair, including antennas and carrying cases (less battery or power pack) **\$199.50**

Add Fed. Excise Tax **7.00**

Handy Battery Pack **6.45**

Central Station Power Pack **34.65**

Citizens Radio Power Pack (specify 6 or 12 volts) **31.00**

New Deluxe Transmitter Kit JOHNSON VIKING II 100 WATTS ON PHONE 130 WATTS ON CW



Every desirable feature has been included in this outstanding transmitter. BAND-SWITCHING to all amateur bands, from 160 through 10 meters...TVI suppression...100% AM modulation...PARALLEL OUTPUT 6146 tubes...PUSH-PULL 807 MODULATORS. Supplied complete with pre-punched chassis, copper-plated steel cabinet, tubes, hardware, assembly instructions, and all necessary parts and components. **\$279.50**

Viking II complete with tubes, wired and air tested **324.50**

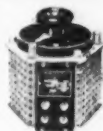
Viking VFO Kit, worthy companion to the Viking II **42.75**

VFO Kit—wired and tested (with tubes) **62.75**

Viking Mobile Kit, up to 60 Watts input for that rig-on-wheels **99.50**

SUPERIOR POWERSTATS

Smooth, efficient voltage control, 0-135 volts output from 115 volt AC line. Models also for 230 volt input. Write for free literature. Models for table and panel mounting.



Type 10, 1.25 amps	\$ 8.50
20, 3 amps	12.50
116, 7.5 amps, table mtg.	23.00
116U, 7.5 amps, panel mtg.	18.00
1126, 15 amps	46.00
1156, 45 amps	118.00

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B: Bill Cummings, W1RMG

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calls are V06J at Goose and V060 and V06V at Cape Harrison. V06Y piled up 10,320 points in the CD Party. V06L has the ground plane working nicely. V06AD with a TBS50 and rhombic, also is knocking 'em off. V06A is putting up a beam to work into home QTH. Dartmouth, N. S. V06J is on with 20 watts c.w. at Goose. W7RTS: V06 and W0WNI/V06 are doing lots of 'phone patch traffic on 14 Mc., whenever band conditions allow. Medical traffic has picked up all along the Coast and quite a number of evacuations have been made possible through the Labrador Net. The Labrador Net has over 23 stations active and in the main supplying the ONLY communication with outside points. A few of the members are V06A Cape Harrison, V06AF Hebron, V06B N. W. River, V06C Cartwright, V06F Hopedale, V06G Rigolet, V06K Makkovik, V06M Nain, and VE2ASL V06G Indian House Lake. Net time is 2030Z daily on 3780 kc. Following are VE1 items: A new one hooked recently by 1Q and DQ is KE3AB. He's on 14 Mc. 'phone and c.w. near the low end of the band. GM says there is not enough interest in the MTN and meantime he provides liaison between VE2, VE3, on TRN and PQN (3675 and 3750 kc.) at 2015 and 2045 daily. DB has been chasing DX. W1 again has rebuilt his final. WD has built a new radio room. 1Q is building a grid-dipper. Traffic: VE1FQ 220, VE1AAW 126, V06N 90, VE1ZM 42, V06B 33, V06S 20, V06A 14, VE1OM 12, V06K 12, V06G 11.

ONTARIO—SCM, G. Eric Farquhar, VE3JA. Welcome, and good wishes to the Norfolk Amateur Radio Club, recently organized. Likewise to its participation in the Norfolk County Fair, from which point a nice traffic total originated. Charter officers are AQB, pres.; AJW, vice-pres.; DLL, secy.-treas. Timmins's loss is Cochrane's gain, with AZZ recently being transferred to take over management of transient company. Luck, GM. The Second Annual Canadian International Hobby Show is to be held Feb. 5th to 13th in the Coliseum, Canadian National Exhibition Grounds, Toronto. The Nottown Radio Club of Toronto again will sponsor an amateur radio exhibit. Several rigs will be in operation and traffic-handlers are invited to give this worthy enterprise support. Those attending the fair are asked to leave their QSL cards at the exhibit. BTQ has been posted to VO-Land. Good luck, GM. BHS now sports a two-letter call, CC. Welcome to CMO, a newcomer and the fifth visually handicapped person in the Ottawa Area. He finds much pleasure and relaxation in his hobby. AVX is Kapuskasing's newest ham. BTQ and DEQ visited AVS, who in turn paid social calls on BOJ, BGK, DAD, and PA while in Kirkland Lake. Kitchener has six stations on 420 Mc. Traffic: VE3ATR 247, BUR 213, JA 131, G1 41, BJV 39, DC 28, BHM 24, NO 22, SG 22, MOG 21, VZ 21, ACU 19, DQA 12, DQN 12, DLM 11, DPG 11, AVS 8.

QUEBEC—SCM, Gordon A. Lynn, VE2JL. —ATE is in Ste. Therese, ATX in Mount Royal, and ATO in Lac Noir and not in St. Maurice Valley, as reported in October QST. The error is regretted. CO visited HB9T and HB9KX on a recent trip to HB-Land. LM has returned to Westmont, with 150 watts input to a pair of 6146s. DR is active on PQN, OSN, TRN, and QEN. EC is HB, both handling considerable traffic. YA is ex-VE7EO and has erected an impinging antenna right behind CO! LO continues active on PQN and other skeds. JI is ex-VE3AZL and has 829 rig with a home-built receiver with double conversion and selective audio filter. BG reports active on OOTC Thurs. with good results from a Viking II, and had visits from VK3AM, and W2AHU. EC continues with skeds and is looking for Montreal stations on 3600 kc. daily at 1:00 p.m. CA has had increased activity to the Arctic despite watching TV each evening. AB and AAO took part in the September Frequency Measuring Test. The South Shore Amateur Radio Club now is affiliated with ARRL. The South Shore ARRLC gang took part in a demonstration of a simulated enemy attack on St. Lambert, with considerable publicity in that area. TX and AGF gave a further talk at the MARC on the handy walkie-talkie, six of which are on the air and six more under construction. ANT has changed his QTH to St. Martin. LP again is active and is building a rig for 6 and would like to hear from other 6-meter boys. Traffic: VE2DR 208, HB 60, BG 35, CA 28, EC 15, GL 13, LO 10.

ALBERTA—SCM, Sydney T. Jones, VE6MJ. —WC is QRL because of the arrival of a YL jr. operator. Congrats, Tom and NXL. EO reports a real swell visit to Eastern U. S. A. and a side trip to WIWA. The Calgary ARRLC combined business with pleasure during Halloween by patrolling city streets but reported only the usual small offenses. YE has 'phone privileges now. AE has a new antenna and is active once again. HM and NX still are keeping skeds with the boys in the north. JG has returned to the air after a long absence. EA has a new long-wire antenna. MJ has been QRL building new audio frequency measuring device. Traffic: VE6OD 45, WC 22, HM 18, MJ 4.

(Continued on page 110)

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BRITISH COLUMBIA — SCM, Peter McIntyre, VE7JT — After many moons of staying off the air, DO, of Westview, got the "urge agin" and now is poking out a signal on 75 meters. PO, of Victoria, has resigned as SEC, and at the time of this writing a new SEC has not been appointed. The AREC in the Vancouver Area, under the direction of the EC, AOB, and the Liaison Radio Officer, DD, had a very successful exhibiting booth at the civil defense show held at Vancouver the latter part of October. BV visited the local area during the month and was literally "in a fog" but he brought the weather with him. YA will be missing from the ranks for a while as he was married Nov. 27th. Anyone holding appointment in the ARRL who should report to the SEC or the SCM monthly is reminded to do so or have the appointment cancelled. There are some who report faithfully every month, so if they can find the time to drop a line surely the rest can do the same. Activity shows interest. You are reminded to read the regulations on the back of your station license. If you are not certain of the correct interpretation of the regulation, contact D.O.T., to make sure you are not operating contrary to regs. A Happy New Year to you all. Traffic: VE7QC 60, DH 26, FS 16, JT 16.

SASKATCHEWAN — SCM, Harold R. Horn, VE5HR — BZ has asked to be relieved of his duties as SE and LU has been appointed as his successor. Our thanks to BZ for his good work during his term in organizing the section further. Our good wishes to LU, and with the cooperation of members and others in the section we will be prepared for any event. Officers of the following clubs are: Regina, WW, pres.; LU, vice-pres.; G. Murphy, secy-treas. Saskatoon, AJ, pres.; OB, secy.; AE, treas. Moose Jaw, IL, pres.; OM, vice-pres. KG, treas.; WA, secy. DZ has received her WAS certificate. Congratulations, Eiba, MY finally turned to "phone and is heard on 75 meters. Our best wishes to GO and GI for speedy recoveries after serious operations. FS has left for Ottawa as a member of Parliament. GT has a new rig on "phone with 813 final. OC reports good results with his new ground plane on 14 Mc. MN has his home rig going on 7 and 14 Mc. now. IQD visited Saskatoon. LD has a new 100-watt rig. The "phone net is in need of an outlet at Prince Albert and Regina in particular, and will welcome other members anytime. Traffic: VE5HR 30, GX 14, PJ 13, RE 8, CB 6, QL 4, DD 3.

V.H.F. Party Results

(Continued from page 61)

SOUTHWESTERN DIVISION	CANADIAN DIVISION
Los Angeles	Quebec
W6MMU/6 500-98-5-BD	VE2AOK 28-7-4-B
Santa Barbara	Ontario
W6FYW/M 15-5-3-B	VE3AIB 2240-111-20-ABD
	VE3DNX 860-86-10-B
	VE3BWT 432-48-9-B
	VE3BMB 420-60-7-B
	VE3DIR 318-53-6-B
WEST GULF DIVISION	VE3BPP 133-19-7-B
Southern Texas	VE3DNQ 57-19-3-A
W5TAF 54-17-2-B	VE3AEA/3 (VE3s BAF BNZ) 24-8-5-A
W5YCK 20-10-2-B	1 W2TUK, opr.
W5FEK 6-6-1-B	2 Hq. Staff — not eligible for award.
New Mexico	3 Aeronautical mobile — not eligible for award.
W5RFF 2-2-1-B	

Strays

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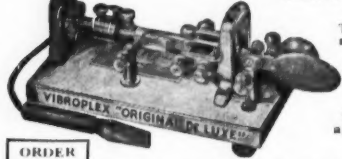
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112

Six-Band Rig

(Continued from page 10)

The outside end of L_9 (the end near the front of C_9) is connected to the front terminal of the rear stator section. The inside end of L_9 should connect straight down to the rear terminal of the front stator section of the condenser. Use lengths of $\frac{1}{4}$ -inch copper tubing for these two leads. The rear, or plate, end of L_7 should go to the rear stator of C_3 and the inside end of the coil can be attached directly to the condenser support bar with a machine screw. After the assembly has been bolted to the chassis, complete the wiring between L_3 and the output switch, S_2 . The large section of L_3 provides coupling at 3.5 and 7 Mc. and the 1-turn link takes care of coupling at 14 Mc. and above.

The panel and the chassis can now be fastened together by means of the panel-mounted components. National type P and HRS knobs are used with the excitation and the lower line of controls, respectively. Later on, the two will be rigidly held together by means of the shielding that encloses the transmitter. The various views of the transmitter show how perforated aluminum, $\frac{1}{2}$ -inch angle and self-tapping screws (except for the use of binder-head machine screws for fastening to the panel) have been used in the construction of the shielded enclosure.

Most of the power wiring is done with Belden No. 8885 shielded wire. A heavy-duty type of shielded wire (Belden 8656, Birnbach 1820, or shielded ignition cable) should be used for the h.v. leads to the 813 circuit, and solid tinned wire is used for r.f. wiring.

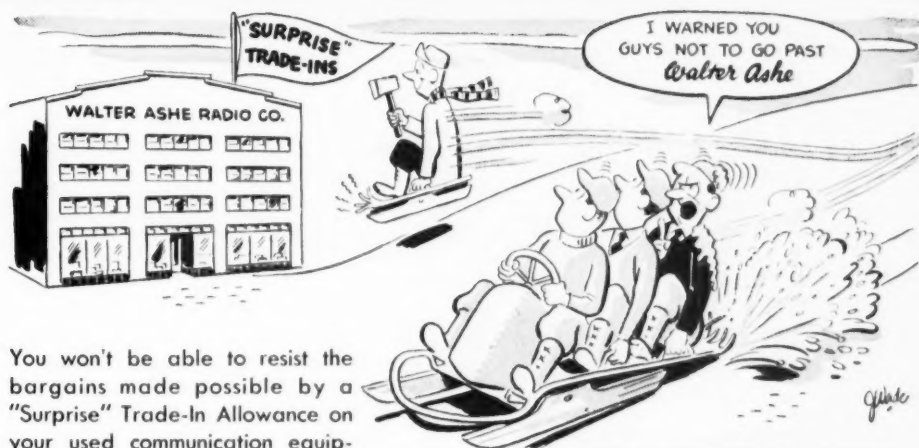
Adjustment

A 400-volt 250-ma. supply is required for the exciter and the screen of the final amplifier. For full rated output from the 813, a supply delivering 2000 to 2200 volts at 300 ma. (including bleeder current) is needed. The amplifier may, of course, be operated at lower plate voltage with less power input.

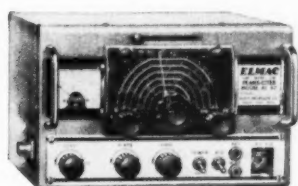
The VFO tuning ranges should first be adjusted. Set S_1 to the first position, biasing the screen of the 6146. Adjust the screen potentiometer in the 5763 multiplier stage to zero, and turn on the filaments and the low-voltage supply. Set C_1 at 95 degrees on the dial (near minimum capacitance). Set C_2 accurately at midscale. Then, listening on a calibrated receiver, adjust C_3 until the VFO signal is heard at 3750 kc.

Now, tune the receiver to 3500 kc., and turn C_1 toward maximum capacitance until the VFO signal is heard. This should be close to the lower end of the dial. By carefully bending the rearmost rotor plate of C_1 toward the rear, it should be possible to adjust the range of 3500 to 3750 kc. so that it covers from 5 to 95 degrees on the dial. Some slight readjustment of C_3 may be necessary during the plate-bending process to keep the band centered on the dial. Mark the setting of C_2 accurately so that it may be reset easily.

(Continued on page 114)



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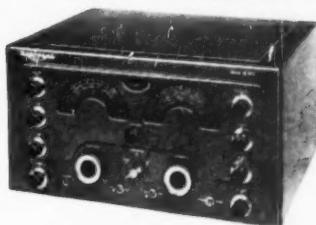
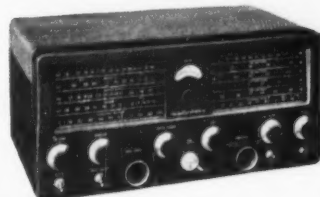


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Now, set C_1 at about 15 degrees. Set the receiver at 3750 kc. and reduce the capacitance of C_2 until the VFO signal is heard. Then, tuning the receiver to 4000 kc., the VFO signal should be heard when its dial is set at about 85 degrees. Mark this setting of C_2 .

If it is desired to center the 11-meter band on the dial, set C_1 at midscale. Increase the capacitance of C_2 until the VFO signal is heard at 3387 kc. Mark this setting of C_2 , also accurately.

The next step can be done most easily with a high-resistance voltmeter connected across the grid leak of the 5763 buffer amplifier. Set C_1 and C_2 at minimum capacitance, and adjust the slug in L_2 for maximum grid voltage. Then watch the grid voltage as C_2 is swung through its range. If there is appreciable increase in grid voltage as C_2 is turned toward maximum capacitance, tune L_2 to a higher frequency by moving the slug out more. By correct adjustment of the slug, the grid voltage should remain essentially constant over the entire usable frequency range.

Now turn the meter switch to read 6146 grid current, and turn the excitation control to maximum. Resonate the output tank circuit of the 5763 frequency multiplier at 80 meters (near maximum capacitance) as indicated by maximum 6146 grid current. Reduce the excitation control to give a 6146 grid current of 2 or 3 ma.

Next, turn S_1 to the second position, so that screen voltage is applied to the 6146, but not to the 813. Turn the meter switch to read 6146 plate current, and resonate the 6146 output tank circuit as indicated by the plate-current dip (near maximum capacitance). Turning the meter switch to read 813 grid current, adjust the excitation control to give a reading of about 25 ma. With this portion of the transmitter lined up, it is to be expected that the plate current for tubes V_4 , V_5 and V_6 will be approximately 35, 15 and 50 ma., respectively.

The 813 should be tested initially at reduced plate voltage. Plate voltage can be reduced by inserting a 150-watt lamp in series with the high-voltage transformer primary. A 300-watt lamp bulb connected across the output connector can be used as a dummy load for testing. Turn S_1 to the third position to apply screen voltage to the 813, set S_2 at the low-frequency position, apply plate voltage and resonate the output tank circuit (near maximum capacitance) as indicated by a dip in plate current. Full plate voltage may now be applied and C_{10} adjusted to give proper loading (220 ma. maximum). Adjust the excitation control to give a final-amplifier grid current of 15 to 20 ma. Screen-current for the 813 should be approximately 40 ma. when the excitation and loading are properly adjusted.

Tuning up on the other bands is done in a similar manner, by adjusting the tuners in each circuit to the correct band to obtain the desired multiplication. Plate current in the multiplier and driver stages will increase to values of 35 and 90 ma., respectively, when these

(Continued on page 116)

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- ★ Bandswitching except for final amplifier. No retuning when changing bands except for final.
- ★ Crystal filter sideband generation for maximum stability of carrier and unwanted sideband suppression.
- ★ Double conversion mixing with crystal controlled mixer-oscillator on 40 and 20 meters for maximum frequency stability.
- ★ Variable carrier injection on all bands for receiving as well as transmitting. (Receiver injection is especially advantageous for use with a receiver equipped with mechanical or crystal lattice sideband of SSB signals.)
- ★ Deluxe Relay Rack Cabinet 36" high.

ELENCO 400-T3 SSB Transmitter, complete. \$695.00

ELENCO 400-T4, same as 400-T3 but including either the 10 or 15 meter band, complete. \$745.00

Necessary crystal for making both the 10 and 15 meter bands available on the 400-T4. \$5.95

Individual units making up either transmitter are available separately, cabinet or relay rack style. The new Elenco Catalog lists our entire line of SSB equipment. A card or letter to the factory will bring it to you promptly.

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circuits are used as frequency multipliers. The table shows the approximate dial setting for each band, but each should be checked with an absorption wavemeter and the setting logged for future reference.

Naturally, an antenna tuner will be required if the transmitter is to be worked into an antenna system using anything other than coaxial feed. The rig has been coupled through conventional tuners during the testing and on-the-air operating periods, and we are quick to admit that these run-of-the-mill tuners slow down the band-changing operation. In fact, when it takes more time to make frequency changes in a simple coupler circuit than it does in a 500-watt rig—well, it's high time to do something about the situation. We can't make any promises at the moment other than to say that the very next project will be some sort of wide-range, get there-in-a-hurry tuner. Naturally, we'll pass the good word along if this idea pans out.

Correspondence

(Continued from page 62)

experimenting with A5 emission, may use the suffix "TV" in announcing his station call sign.

"The use of any prefix, suffix, or other innovation (except phonetic aids to identify the station call sign as provided by Section 12.82(d) of Part 12) is prohibited by Section 12.158 of Part 12."

This letter was signed by Wm. P. Massing, Acting Secretary.

As I said above, I do not know if anyone has ever transmitted the "-TV" suffix; but, for the benefit of any who might contemplate doing so, I have one word of advice: DON'T.

By the way, I hope that there will be more articles on ham TV.

—James C. Grubs, W8GRT

PUBLIC RELATIONS HELPS

29 High St.
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Editor, QST:

I wish to express my thanks for your fine help in helping me make my speech on amateur radio. The Lions Club here enjoyed it very much and the booklets you sent were passed out to all the members. From the prepared speech you sent, I had at my fingertips very good information to tell them. It was very helpful and have been asked to speak at the local schools because of your fine help. I wish not only to thank you, but the League in backing me up.

—C. Burns Robinson, W1SDG

STOLEN EQUIPMENT

3108 Wenz Ave.
Waco, Texas

Editor, QST:

Recently someone broke into the Civil Defense building and stole the following amateur equipment which was the property of the Central Texas Amateur Club: one Johnson Viking-I transmitter, with four holes drilled in the top near the center for mounting the Johnson VFO (the VFO was of course taken along), and one National 183-D receiver with four holes drilled in the bottom for mounting on a board. Both the transmitter and receiver were mounted on a large board for easy transportation in case of emergency.

If possible, we would like for you to insert a notice in QST so that others may be on the lookout for this equipment.

—C. J. McCauley, Secy., W5TVA
Central Texas Ama. Radio Club

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Simpson 260. Set Tester (Roll Top).	
62F303. Shpg. wt., 9 lbs.	45.96
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Covers 540 kc to 43 mc.	
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Covers 540 kc to 30 mc.	
98F318. Shpg., wt., 10 lbs.	59.95
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Covers 540 kc to 40 mc.	
98F312. Shpg. wt., 30 lbs.	129.95
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Compact Beam

(Continued from page 18)

for forty meters. It was adjusted for the center of the portion of the twenty-meter band normally used and is left that way.

On forty, each element is balanced by adjusting its series condenser which bucks out the reactance of the loading coil and leaves the circuit looking like simple series tuning so far as forty meters is concerned. This balancing is done at the center of the portion of the 7-Mc. band normally used.

The final test is that any pair of elements must load the transmitter equally on both bands. Under these conditions the elements are electrically equal. If the beam is near a house or trees as mine is, the inductance and capacity in each leg may not be the same, due to the influence of the surrounding objects.

In evaluating the worth of any antenna, the appearance of the logbook over a long period of time makes a good yardstick of performance. The ratio of QSOs to calls made tells the story. Applying that yardstick to this antenna would indicate that it does a good job on twenty meters both on DX and on domestic contacts. It won't cause the three-element beam boys any headaches but it does a good job in cramped quarters.

On forty meters the ratio of QSOs to calls goes up and the number of DX contacts made on the first call is marked.

When receiving, this antenna has a fault common to all verticals. It likes to pick up noise. However, the ability to steer the directivity compensates to some extent, particular on man-made noise when the beam is at right angles to the source of the noise. So, in practice, this one drawback to the use of a vertical beam is more theoretical than actual.

A.M. Equivalent of S.S.B.

(Continued from page 22)

That word "peak" evidently is of first importance, and it is the sort of word that easily can be overlooked by those not accustomed to thinking in terms of peak output. The usefulness of a comparison based on peak output would be doubtful if Norgaard had not also demonstrated that it is possible to obtain the same peak output, in both single sideband and a.m., with the same final tube or tubes, without exceeding the plate dissipation ratings in either case. Not inevitable, but possible.

How does one do it? Consider the a.m. case and assume 400 watts input obtained by using 2000 volts at a plate current of 200 ma. When the amplifier is plate modulated, the plate voltage goes to 4000 at the modulation peak and the plate current goes to 400 ma., 1600 watts input. The output at the peak is likewise four times the carrier output. The peak plate efficiency of a single-sideband linear amplifier will be near enough to the plate efficiency of a Class C amplifier so that we will not be much in error in assum-

(Continued on page 120)

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Accommodates 2 high impedance inputs. Separate gain controls for mixing. Connected directly to equipment. No external cables. Minimum lead-length inside shielded housing minimizing "stray-pickups". Ideal for use with tape, wire, or disc recorders, amplifiers, musical instruments, etc. Size: 2-1/16" x 1-13/16" x 1-1/16".



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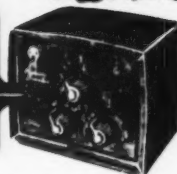
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• —52 db output level

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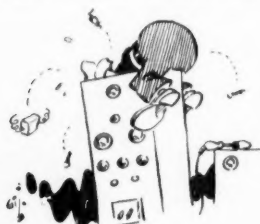
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ing that we can get the same peak output from the linear that we get from the Class C stage if they both operate at the same peak input.

But how to get that 1600 watts peak input to the linear? It can't be done by operating the tube at the same 2000 volts that was used on the plate-modulated amplifier because that would require a peak plate current of 800 ma.; and if the tube is one that was operating at its normal ratings with 2000 volts and 200 ma., it is extremely unlikely that it could be made to draw 800 ma. at the same plate voltage no matter how hard we tried to drive it. We know that it would take the 1600 watts if we raised the plate supply voltage to 4000 and drove the tube to 400-ma. peaks, because it does that well with plate modulation. Whether the tube would operate safely over a long period of time at double the voltage rating for plate modulation, assuming operation within the plate-dissipation rating, is a question. Purely from the standpoint of voltage breakdown it seems as though it should, because it had to stand those peak voltages with plate modulation. However, there are other factors which this writer is not competent to assess, particularly with high-voltage tubes. Some increase in plate-supply voltage over the maximum rating would certainly seem reasonable. Perhaps in the present example we might settle for something like 3000 volts, calling for a peak plate current of 530 ma. to get the 1600-watt peak, provided the tube curves showed that it was practical to get such a peak current at that plate voltage.

The point is that the 6-db. increase in talk power is not automatic; you have to do something to get it. Simply feeding a single-sideband signal



THE
 INCREASE
 IN TALK POWER
 IS NOT
 AUTOMATIC—
 YOU HAVE TO
 DO SOMETHING
 TO GET IT

to the grid and operating the amplifier as a linear at the same plate voltage that was previously used with plate modulation will not ordinarily do anything more than provide the same peak output on s.s.b. as the carrier output with plate modulation, and we have seen that these two are equivalent in talk power. If the final is a tetrode, you might double the peak plate current, at the same plate voltage, by raising the screen voltage appropriately; in this way 3 db. could be realized.

Why Single Sideband?

Along about now we can visualize the sidebander who had delusions about the might of his s.s.b. signal in comparison to a.m., feeling that some of the wind has been taken out of his sails, and the a.m. man who has been thinking of changing over to s.s.b. because of the power gain

(Continued on page 122)

LOOK STEINBERGS LOOK

MOBILE SINGLE SIDEBAND OR FIXED STATION . . . AND LOOK AT THE PRICES!

From the laboratory of Electronic Engineering Co., builders of the famous SS-75, comes the newest in fine, low-cost single sideband equipment, small enough for mobile operation, but powerful enough to drive a high-power final. Refer to description on page 58, December, 1953 QST.



ELENCO X-4 SSB EXCITER

Only 6" x 6" x 6", small enough for mobile operation. 10 watts peak output, enough to drive most finals to 1 KW input. Uses SAME TYPE CRYSTAL FILTER USED IN SS-75. Output frequency 3.6 to 4.0 MC when used with suitable VFO or crystal. Provision for VFO or crystal operation. Audio gain sufficient for crystal or dynamic microphone. 4-tubes: 6SA7 crystal oscillator and audio mixer, 6SQ7 speech amplifier, 6SA7 second mixer and VFO, 6F6 4 MC power output. Power required: 6.3V @ 1.6A., 200-300V @ 80 Ma. D.C. 45V bias.

Wired, Tested, Aligned \$69.50. Kit Form **\$49⁵⁰**



ELENCO X-4 VFO

Only 4" x 4" x 2". The VFO is a modified Clapp circuit utilizing the 6SA7 second mixer in the X-4 Exciter to furnish oscillator voltage. No tube in VFO unit, adding greatly to stability. Provision for upper or lower sideband selection. Silver mica padders and ceramic oscillator coil form used for maximum stability. Provides coverage for 75, 40, 20 meters when used with X-4 mixer. 4" tuning dial covers 3.6 to 4 MC in 50 KC steps. Requires no power, plugs into crystal socket on back of X-4. 18" twin coax cable and plug furnished.

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ELENCO X-4 VOICE CONTROL

Designed to permit voice controlled operation of the X-4 Exciter and associated receiver for fixed or mobile use. Uses 6SN7 dual triode, one section used as voltage amplifier, second section used as a negative pulse gating tube which controls the voice operated relay. Built in 4" x 4" x 2" cabinet. Power required: 6.3V @ 6A., 200-300V, 10 Ma., D.C. Furnished with power plug and socket, less connecting cable.

Wired and Tested . . . **\$19⁹⁵**



ELENCO X-4 MIXER

Designed to use with the X-4 Exciter to convert the 4 MC SSB signal to 40 or 20 meter output. Uses a 6L6 as a combined crystal oscillator and mixer stage with output up to 10 watts on 40 or 20 meters. Built in 4" x 4" x 2" cabinet. Power required: 6.3V @ 9A., 200-300V, 60 Ma., D.C. Furnished with one coil and one crystal (specify 40 or 20 meters). Coil and crystal for the alternate band, add \$5.70.

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ELENCO X-4 POWER SUPPLY

The X-4 AC operated power supply, mounted on 7" x 7" x 2" chassis, furnishes 300 volts, 150 Ma., D.C., plus 6.3 volts AC., more than ample to operate the X-4 Exciter, complete with Mixer, VFO, and Voice Control unit. It also supplies 45 volts negative, for bias and muting purposes. A 4-pole, 3-position switch is provided and wired into the circuit. This switch serves as a manual control switch for the X-4 Exciter and the receiver in use. One set of contacts is terminated on one of the power sockets, to be used for controlling the high voltage primary relay for the high power final; if one is used. The fourth set of contacts is not wired and can be used for any switching purpose. 80 Mfd filter and 10 Henry choke provide for hum-free operation. Three power output sockets, with plugs, are provided to permit individual plug-in connections for each unit.

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probably is wondering if single sideband isn't after all overrated. The "a.m. forever" man no doubt will take some comfort from "deflating" single sideband, but only until he begins to realize that he no longer has the "tremendous power gain" excuse to explain how it is that single sideband stations work rings around him.

For the fact is that, power gain or no power gain, single sideband is capable of doing just that — working rings around a.m. stations of much higher power. The reasons are varied, and to go into them would require another article as long as this one. Many of them were well covered in Don Norgaard's article, and the operating techniques that have developed since he wrote it provide many more. Single sideband is not just another kind of 'phone transmission. As those who use it will tell you, it is a different and superior form of communication. Power comparisons of the type we have been discussing are only a minor part of the complete picture.

Converter for 432 Mc.

(Continued from page 27)

the resonance point excessively. Our experience has indicated that optimum reception is obtained with the coupling set so that the amplifier has to be repeated slightly in tuning over more than one megacycle. There is an increase of about two S-units in the noise level as the r.f. tuning is peaked in the presence of no signal. This is with an antenna or dummy load connected to J_1 .

The mechanical arrangement shown is admittedly somewhat clumsy for adjustments involving the interior of the lines. Several other set-ups were tried, in which open troughs or troughs having removable covers were used. The lack of complete shielding destroyed the effectiveness of the r.f. stage in each case, so the complete enclosure shown was found to be necessary. Changes can be made fairly easily if the assemblies are fastened down with three or four self-tapping screws temporarily. It is then possible to make adjustments by removing these screws and unsoldering three connections each time. The improvement afforded by the complete shielding is well worth this slight extra effort.

Results

Use of this converter, and the experimental versions that preceded it, at W1HDQ, has resulted in a wholly new evaluation of the 420-Mc. band. For some time we had been having good results in 432-Mc. work whenever conditions were favorable. Even several years ago, we found that signals on this frequency were quite capable of outrunning those on 50 and 144 Mc. when weather conditions were right. Under adverse conditions, however, there appeared to be a wide margin in favor of the lower frequencies in DX work.

Recently we have just about overcome this handicap. Several months of daily checks with W2QED, Seabrook, N. J., a distance of 210 miles, have demonstrated that any time he has a readable signal on 144 Mc., his 435-Mc. signal

(Continued on page 184)

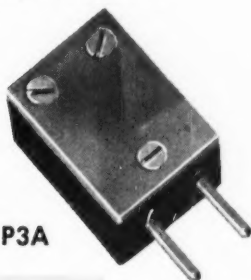
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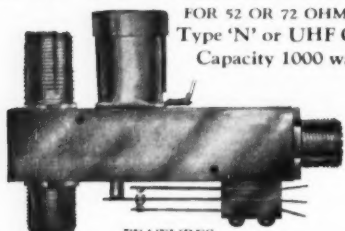
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will be heard. The comparison of the two bands is subject to endless variations, some of which we've not yet completely explained, but the important point is that the recent improvements in r.f. amplifiers and the change to crystal-controlled converters have put us "in business" on 432 Mc. over distances that would have been considered impossible even on 144 Mc. a few years back.

There is, we feel, an important lesson here for the beginner, and particularly for the Technician licensee. It is obvious, now, that with the right equipment, work on the 220- and 420-Mc. bands need no longer be thought of as backyard stuff. The same is very likely true of still higher frequencies. We've hardly begun to exploit their possibilities!

Transistor C.W. Monitor

(Continued from page 29)

monitor when 'phone operation of the transmitter is required. With the switch in the open position, the transistor receives no power and therefore does not oscillate. The same end could be achieved by unplugging the audio output connection or disconnecting the pick-up wire. However, a switch requires much less effort and time to accomplish the same result.

Construction

The entire monitor can be built very conveniently into a 4 X 2 1/2 X 1 5/8-inch aluminum utility box (Bud CU-3002). The tuned circuit, connected to the base of the transistor, uses a small condenser and two war-surplus r.f. chokes (L_1). The chokes are unnecessarily large, physically, and in addition, two chokes have to be used in series to arrive at a suitable value of inductance. These chokes did offer the distinctive feature of only costing 19 cents apiece and, what was more important, they were available when we needed them. Their inductance is about 85 mh. and they have a d.c. resistance of 300 ohms each. With two of these in series and a 0.05- μ f. condenser in parallel with the inductance, the actual frequency of oscillation is close to 1500 cycles in our unit.

If it is thought desirable to reduce the bulk size of the monitor, by using only a single choke and increasing the capacitance, a precaution should be noted. The resonant impedance of the parallel-tuned circuit is already quite low due to the Q of the r.f. chokes at audio frequencies (only about 2!), and any further drop in impedance will cause a drop in the audio output. Obviously, iron-core chokes can be used to raise the resonant impedance and output, but this will add to the weight and size of the monitor. If it is necessary to use only a single choke it might be better to settle for a higher output frequency by maintaining the same value of capacitance. At 75 milliwatts input (5 volts at 1.5 ma.), the output, directly across the tuned circuit, using the suggested values, is 4.5 volts peak to peak.

(Continued on page 126)

Uncle Dave's Radio Shack

SUBSIDIARY OF
FORT ORANGE RADIO DISTRIBUTING COMPANY

Greetings and Good Wishes for 1954



Uncle Dave, W2APF

*A*T the beginning of this New Year our thoughts go back to the early days of radio. It has been our privilege to have been associated with this great industry practically from its inception. We have seen the transition from the spark coil transmitter and crystal receiver to the efficient modern version of "ham" equipment.

The growth of the Fort Orange Radio Distributing Company from its early days to the present has been steady. We feel that this is a tribute to our established policy of giving the "ham" the best there is at a fair price. We number among our customers many who were with us from the first day. That is a source of pride to us.

To the old timers and the new comers alike we sincerely offer our best wishes for the year 1954, with a promise of a continued policy of fair dealing and fair prices.

In the year of 1954, as in the years past, we will continue to feature Hallicrafter transmitters, receivers and other "ham" Hallicrafter gear. We invite your inquiries. We are ready now to deliver the newest of the Hallicrafter line, the brand new Hallicrafter SX88 Communicators Receiver.

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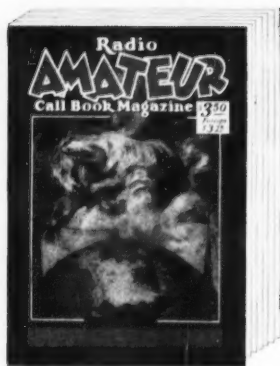
Seventeen tubes plus voltage regulator, current regulator and rectifier. Satin black steel cabinet with gray blue front panel and chrome trim. 20 x 10 1/2 x 18 1/4 deep.



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The length of the lead connecting the diode, r.f. choke, and antenna terminal should be made as short as possible to prevent any unnecessary losses. When soldering to the crystal diode and transistor, pliers should be held between the element and soldered joint to conduct away the heat. Other than those precautions already mentioned, the placement and lead lengths of the parts are not critical.

Operation

To operate the monitor, either connect the headphones directly to the unit or feed the output through the audio stage of the receiver. Before connecting the monitor to your rig, a lot of worries can be removed by first operating the oscillator from a six-volt battery connected temporarily between the antenna post (-) and ground (+). After the unit has been found to operate satisfactorily on battery power, attach a short length of insulated wire to the antenna terminal and couple this to the output of the transmitter. An ideal spot for coupling is directly on the transmission line. This removes the hazard of accidental contact with a high-voltage circuit. Overcoupling the monitor should be avoided, since excessive r.f. may overload the crystal diode. Once a coupling has been found that yields adequate audio output on all desired bands, the monitor can be tucked into a corner and forgotten except when changing over to 'phone operation.

The monitor can also serve as a very handy code practice oscillator, since the transistor will oscillate with as low a voltage as 3 volts. Three or four "penlite" cells can serve as a convenient power source. A 7½-volt C battery kept our unit oscillating for 150 hours continuously. The battery still had plenty of remaining life at the end of this time, but the experiment had to be stopped because we needed the battery for other matters. The monitor can be used to supply code practice for large groups by feeding its output into an audio amplifier. For individual instruction, or when trying your hand with that new bug or automatic key, one or more headphones can be connected directly to the monitor.

Recently we have found another application for the monitor. The amplitude of the audio output is directly related to the amplitude of the r.f. input, so it is therefore possible to use it as a tuning indicator for the various stages of the transmitter. Experience has shown that it is possible to tune a multistage rig, stage by stage, "on the nose" by just using the monitor. Certainly its cost does not warrant the replacement of meters or neon bulbs, but we feel that the monitor might find some tuning application for sightless amateurs.

X-Straps

Reader Earl V. Reed points out that the masking-tape Hint & Kink for QSL mounting (p. 138, November, 1953, QST) is made even simpler by the use of "double-backed" tape, a variety having adhesive on both sides. X-ray supply dealers are ready sources for this type.

Come Again



Radio - Electronic Men!

Just as you have been coming since 1945 to the IRE National Convention and Radio Engineering Show — coming by the thousands, 35,642 in '53 — so come again to see and hear all that is new in the engineering advances of your industry.

▲ Fifty-four in '54!

— 243 scientific and engineering papers will be presented, skillfully grouped by related interests into 54 technical sessions. More than half these sessions are organized by IRE Professional Groups, thus making the IRE National a federation of 21 conferences in one. The whole provides a practical summary of radio-electronic progress.

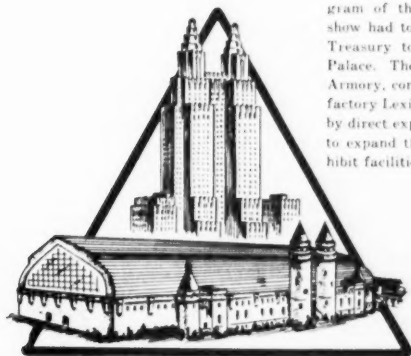
▲ 600 Exhibitors "spotlight the new!" — A mile and a half of exhibits line the avenues of this show, intriguingly named for the elements of radio — such as "Instruments," "Components," "Airborne," "Radar," "Transistor," "Audio," "Microwave," etc., filling the four acres of the great Kingsbridge Armory to capacity. An expanding radio industry shows why it is growing by proving how engineering research pays out in new products. The exhibits themselves are an education, condensed to one place — reviewed in four days.

▲ Kingsbridge is the solution!

Only the combined facilities of the Waldorf-Astoria Hotel, plus the three great halls in the Kingsbridge Armory, seating 306, 720, and 500 respectively, are able to keep pace with the increased technical papers program of the IRE Convention. The show had to move because the U. S. Treasury took over Grand Central Palace. The immense Kingsbridge Armory, connected to the very satisfactory Lexington Avenue Hotel area by direct express subway, serves well to expand the already outgrown exhibit facilities of the Palace and pro-

vide space for 200 new firms to exhibit, as well as seat greater audiences at the high-interest sessions. In addition to the subways, free busses leave the Waldorf every ten minutes in which you may travel in the congenial company of fellow engineers, direct to Kingsbridge.

▲ Admission by registration only! Registration serves for the four day period. It is \$1. for IRE members, \$3. for non-members, covering sessions and exhibits. Social events priced separately.



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March 22-25, 1954

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and
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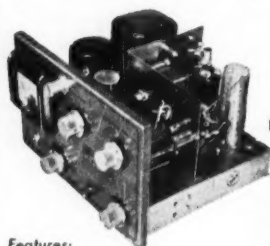
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Happenings

(Continued from page 51)

New York, N. Y.: 718 Federal Bldg.: 641 Washington St.
Monday through Friday.
Norfolk, Va.: 492 Federal Bldg.: Monday through Friday
except Friday only when code test required.
Oklahoma City, Okla.: Jan. 14-15, April 15-16.
Omaha, Nebr.: Sometime in January and April.
Philadelphia, 1005 U. S. Customhouse: Monday through
Friday, 8:30 A.M. to 2 P.M.
Phoenix, Ariz.: Sometime in January and April.
Pittsburgh: Sometime in February and May.
Portland, Me.: April 13.
Portland, Ore.: 307 Fitzpatrick Bldg.: Friday, 8:30 A.M.
for 20 and 13 w.p.m. tests; 9 A.M. for 5 w.p.m. test.
Rapid City, S. D.: Sometime in May.
Roanoke, Va.: April 3.
St. Louis, Mo.: Sometime in February and May.
St. Paul, Minn.: 208 Federal Courts Bldg.: Friday.
Salt Lake City, Utah: March 19, June 18.
San Antonio, Tex.: Feb. 4, May 6.
San Diego, 15-C U. S. Customhouse: By appointment.
San Francisco, 323-A Customhouse: Monday, Novice and
Technician; Friday, General and Extra.
San Juan, P. R.: 323 Federal Bldg.: Thursday, and Monday
through Friday at 8 A.M. if no code test required.
Savannah, Ga.: 214 P. O. Bldg.: By appointment.
Schenectady, N. Y.: March 17-18, June 16-17, 9 A.M. and
1 P.M.
Seattle, 802 Federal Office Bldg.: Friday.
Sioux Falls, S. D.: March 10, June 9, Novice and Techni-
cian at 10 A.M.; others at 1 P.M.
Spokane, Wash.: Sometime in May.
Springfield, Mo.: Sometime in June.
Syracuse, N. Y.: Sometime in January and April.
Tampa, Fla.: 410 P. O. Bldg.: By appointment.
Tulsa, Okla.: Jan. 18-19, April 19-20.
Tucson, Ariz.: Sometime in April.
Wailuku, T. H.: April 9.
Washington, D. C.: 415 22nd St., N. W.: Monday through
Friday, 8:30 A.M. to 5 P.M.
Wichita, Kans.: Sometime in March.
Williamsport, Penna.: Sometime in March and June.
Wilmington, N. C.: June 5.
Winston-Salem, N. C.: Feb. 6, May 1.

Tech Topics

(Continued from page 45)

the indictment. A high standing-wave ratio practically wrecks the harmonic attenuation of a low-pass filter, so it is said.

Once more, let's apply logic. A filter has some unique properties. It has a thing called "characteristic impedance" or "iterative impedance" that must be matched by the load if a signal is to be transmitted through the filter with minimum loss. This characteristic impedance is essentially a pure resistance in the passband. Outside the passband it can take on a wide range of values, none of them resistive. But outside the passband is where the harmonic attenuation takes place. So what is the relationship between matching the filter at the operating frequency, which is inside the passband, and the attenuation of harmonics that fall outside the passband? Quite right—there isn't any. Furthermore, the antennas used by amateurs are resonant affairs that can be adjusted to match the line over only a small band of frequencies near the operating frequency. It would be an unusual case if it came very close to matching the line at a

(Continued on page 130)

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See Page 79

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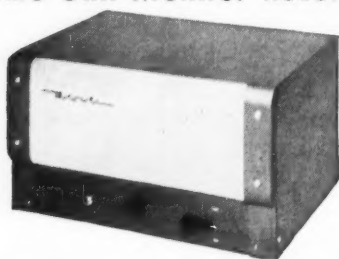
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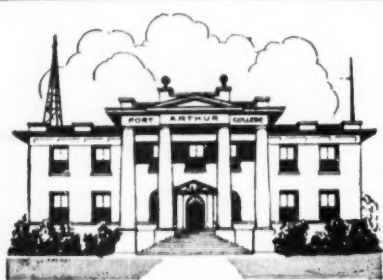
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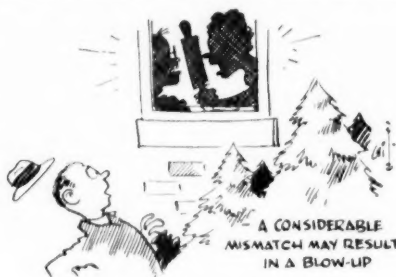
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harmonic at the same time that it matched the line at the fundamental.

This is not to say that conditions on the antenna and transmission line cannot have an effect on the harmonic attenuation. They can and often do, but matching at the fundamental frequency has little or no bearing. A rough-and-ready way to look at a filter is to think of it as a tuned circuit that is resonant at all frequencies inside the passband (which is actually what it is) and as a jumble of coils and condensers outside the passband. It is pretty hard to force power through a miscellaneous collection of coils and condensers. There is order in the filter "jumble" so that frequencies *inside* the passband will go through. That there is attenuation *outside* follows as a matter of course, but you might get just as good an attenuator by selecting the same number of coils and condensers from a random batch while wearing a blindfold, and wiring them together while in the same condition.

Nevertheless, it is really important that the filter should see a load that matches its characteristic impedance at the operating frequency. Primarily, it is because you may burn out some of the coils or blow up a condenser if there is a considerable mismatch, both of which have their

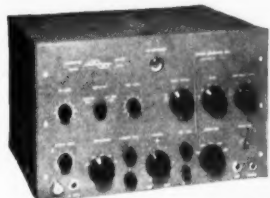


economic repercussions. Secondly, because when the filter is properly matched you also know the impedance looking *into* it, and that lets you use simple design methods instead of cut-and-try to feed power into it. But because matching at the fundamental frequency has any direct effect on the harmonic attenuation? Not in the least.

— G. G.

Strays

Avid newspaper readers will recall the recent renewal of the "War Between the States" in which the cities of Alexandria and Mount Vernon, Va., claimed a fire engine supposedly stolen by Union forces during the Civil War. K2BNI, in charge of New York state's fire training program, and writer John Hart, old-time amateur, had much to do with the yarn. Engaged in research for his work, Mr. Hart came upon evidence indicating that the venerable pumper actually was still in New York state. All plans for the resumption of "hostilities" were approved, of course, by KN2BNI's XYL, KN2DKU.



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PS-1. Plug-in prealigned 90° phase shift network and socket available separately for use with GE Signal Slicer and SSB Jr. \$7.95 postpaid.

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• **NEW CALIBRATE CIRCUIT**—simply talk yourself exactly on frequency as you set VFO.

• **NEW CALIBRATE LEVEL CONTROL**—adjusts signal strength to suit band conditions.

• **NEW FONE PATCH INPUT JACK.**

• **PLUS All the time-proven features of the popular Model 10A.**

Choice of grey table model, grey or black wrinkle finish rack model.

Wired and tested. Amateur net.....\$249.50

QT-1 ANTI-TRIP UNIT

Perfects Voice Operated Break-in with loudspeaker. Prevents loud signals, heterodynes and static from tripping the voice break-in circuit. All electronic—no relays. Plugs into socket inside 20A or 10A Exciter. Wired and tested, with tube.....\$12.50

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Standard pipe thread and coaxial cable connections. Pipe, rod or wire may be used for radiator. Radials may be of wire. For use on any frequency. Bracket available for mounting to support.

EaZon type GP.....\$2.95 Net

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405 Delaware Ave., Wilmington, Delaware

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Willard S. Wilson, President

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A • A • O • N • M • S

YL News & Views

(Continued from page 48)

OM W3LYI likes "Ham-miss" and "Ham-missus."
OM W8OUR writes "How about leaving it as 'YL'? We OMs can dream, can't we?"
OM W2CTP wonders "Why not call single YLs 'SYL' and married YLs 'MYL'?"
YL WN1YNI offers:

YL — single woman with license

MYL — married woman with license

SYL — single woman without license

XYL — married woman without license

But OM VE3EU says "The answer is perfectly obvious. Naturally, the female of 'Ham' is 'Hem'. Don't you agree?"

We're not sure, but we do know that the majority of ideas on the subject have been received from OMs. Could be they're more interested in us than we think?

The YLRL Chairman of the Fifth District is Jessie Harton, W5HWK. First licensed in 1939, Jessie served in the WAC as an officer and instructor from 1944 to 1950. At Scott Air Force Base, Ill. (1946 to 1950) she operated her own rig under the call W9CIR. In 1951 she and her OM went to the Philippines for 18 months, where private amateur operation was not permitted. Now residing in Amarillo, Texas, where she practices law, Jessie is active on 10 and 75.



Hints & Kinks

(Continued from page 63)

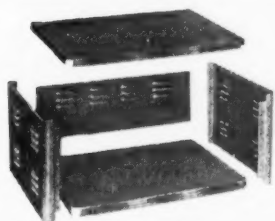
When adjusting the circuit, start with both capacitors at minimum capacitance and the crystal removed from the oscillator. The circuit will oscillate under these conditions and the capacitance of C_2 should be increased until oscillation stops. Now, with the crystal inserted and the plate circuit (C_4L_1) tuned to the third or fourth harmonic, adjust C_1 for a setting that gives maximum output along with minimum crystal current. A slight readjustment of both C_2 and C_1 , in that order, will probably increase the output and decrease the crystal current.

The use of an r.f. choke in series with the grid-leak will reduce the loading on the crystal and may improve the activity of sluggish crystals. The choke should have a different inductance value than that of the plate choke (RFC_1) to avoid any low-frequency parasites.

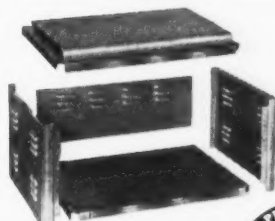
A second look at the grid-plate circuit will show that it is nothing but a Colpitts with the crystal replacing the usual tank coil. If the crystal is replaced with a coil, preferably slug-tuned, and a blocking capacitor is inserted to prevent shorting out the grid-leak, this circuit will operate as a Colpitts with frequency stability determined by the LC ratio of the new inductor and the effective capacitance of the series-connected feed-back capacitors. This provides a handy way of hitting a frequency for which a crystal is not available. — Richard B. Jeffrey, W8GDC

[EDITOR'S NOTE: Additional data pertaining to the keying of the grid-plate circuit is presented in "Crystal-Controlled Oscillators," QST, March, 1950.]

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372	394	415	437	501	522	400	461
374	395	416	438	502	523	401	462
375	396	417	439	503	524	402	463
376	397	418	440	504	525	403	464
377	398	419	441	505	526	404	465
378	401	422	442	506	527	405	466
380	402	423	443	507	528	406	467
381	403	424	444	508	529	407	468
383	404	425	445	509	530	408	469
384	405	426	446	510	531	409	470
385	406	427	447	511	532	410	471
386	407	428	448	512	533	411	472
387	408	429	449	513	534	412	473
388	409	430	450	514	535	413	474
389	410	431	451	515	536	414	475
390	411	432	452	516	537	415	476
391	412	433	453	517	538	416	477
392	413	434	454	518	539	417	478
393	414	435	455	519	540	418	479

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CR-1A	FT-171B	BC-610
SCR 522—1/2	Banana Plug,	1/4" S.P.C.
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6370 7380	2045 2250	2415 3150 3550
6450 7390	2062 2260	2435 3155 3570
6470 7400	2085 2280	2442 3202 3580
6497 7500	2085 2280	2532 3215 3595
6522 7610	2105 2290	2545 3232 3605
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	2143 2320	2940 3322
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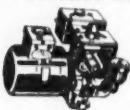
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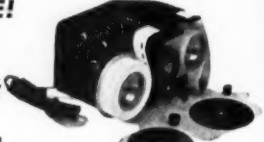
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The President's greeting follows:

FROM THE WHITE HOUSE WASHINGTON D. C.
TO ALL RADIO AMATEURS AND SHORT WAVE LISTENERS GR53 BT
I AM HAPPY COMMA ON UNITED NATIONS DAY COMMA TO SEND GREETINGS TO THE WORLDS RADIO AMATEURS PERIOD IN YOUR EXCHANGE OF INFORMATION YOU DRAMATICALLY EXEMPLIFY THE SPIRIT OF INTERNATIONAL COMMUNICATION AND UNDERSTANDING PERIOD MAY YOUR DEDICATED EFFORT CONTINUE TO BRING YOU THE PERSONAL SATISFACTION YOU ALL DESERVE PERIOD SIGNED DWIGHT D EISENHOWER BT

The message was transmitted by broadcast method 47 times—24 times by c.w., and 23 times by voice. C.w. transmissions were made every hour on the hour. Voice transmissions were made every hour on the half-hour.



Mr. Paul Johansen, Director, United Nations Information Center, and Mrs. Phyllis Scudder of his Washington, D. C., staff watch Corporal Janet Lorman, WAC, transmitting radio message traffic via the Military Affiliate Radio System. Captain Walter S. Browne, jr., USAF, and Major James A. Long, U. S. Army Signal Corps, Chiefs of MARS Air Force and Army programs, respectively, are in the background. Corporal Lorman is operating from the master control of MARS Headquarters Station WAR, Washington, D. C.

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500 Volts — 225 Mils.

filtered d.c. output

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12-volt input **\$31.50**

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Recommended for the Elmac A54H and the new Elmac AF-67 Trans-citer.

Nothing else to buy. Both kits include all hardware, pre-punched chassis and base, rectifier tube, heavy-duty vibrator and have full, detailed assembly and wiring instructions.

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See complete details on pages 4 and 5

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- Tubes: 6AQ5 osc-doub-quad, 6146 final amp, 12AU7 speech ampl., 2 — 6AQ5 mods, Class AB
- Input to final amp. when using Babcock PS 4A power supply: 35 watts
- Complete metering, including RF output watts

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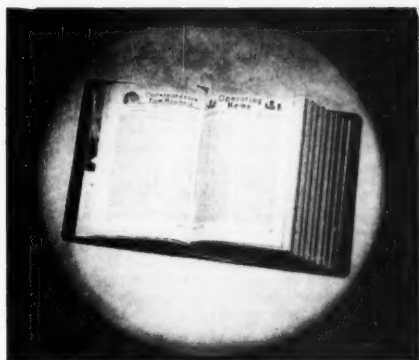
The Naval Reserve was well represented during the ARRL Midwest Division Convention held on October 10th-11th, 1953, at the Hotel Lincoln, Lincoln, Nebraska. Personnel of the Naval Reserve Training Centers at Lincoln (KØNRL), Omaha (KØNRO) and Denver, Colorado, (KØNRC) combined their efforts in furnishing operative Navy radioteletype equipment, TCS transmitter and receiver.

Code Practice

District Naval Reserve Master Control Stations shown below conduct code transmissions for the training of communication personnel of their respective naval districts. These broadcasts are available for use by amateurs desiring code practice. (Stars indicate simultaneously-used frequencies.)

District	Stn.	Location	Freq. (kc.)	Periods	Speed (w.p.m.)
First	NDA	Boston, Mass.	2484	7:45-8:45 P.M. EST Mon.-Thurs.	14
Third	NDB	Brooklyn, N. Y.	2916	8:15-8:45 P.M. EST Mon.-Thurs.	10
Fourth	NDQ	Philadelphia, Penna.	5790	7:50-8:05 P.M. EST	16
			2956	8:05-8:35 P.M. EST	8
				8:35-8:50 P.M. EST	12
				8:50-9:20 P.M. EST	8
				9:20-9:35 P.M. EST Mon.-Thurs.	12
Fifth	NDC	Norfolk, Va.	3490	8:00-8:20 P.M. EST	10-15
				9:00-9:20 P.M. EST Mon.-Thurs.	6-10
Sixth	NDG	Charleston, S. C.	7455	3:00-3:30 P.M. EST	12
			2772	9:00-9:30 P.M. EST Mon.-Thurs.	12
Eighth	NDE	New Orleans, La.	2884	7:30 P.M. EST	7
			8000	8:00 P.M. EST	7
			2884	8:00 P.M. EST	15
			4105	8:00 P.M. EST	15
			4530	8:00 P.M. EST	15
			8000	8:00 P.M. EST	15
			2884	9:30 P.M. EST	10
			8000	9:30 P.M. EST Tues.-Thurs.	10
Ninth	NDS	Great Lakes, Ill.	2656	7:30-8:30 P.M. CST	10
				8:30-9:30 P.M. CST Mon.-Wed.	15
Eleventh	NQG	San Diego, Calif.	2792	8:00-8:30 P.M. PST	8-10
Twelfth	NDW	San Francisco, Calif.	2820	★ 2:00 P.M. PST	15
			5865	★ Mon.-Thurs.	
			8150	★ 11:30 A.M. PST	
				★ Friday only	
			2820	★ 8:00 P.M. PST	15-7
			5865	★ Tues.-Thurs.	
			8150	★	
Thirteenth	NDP	Seattle, Wash.	446	7:00-10:00 P.M. PST	10-5
			2780	Mon.-Thurs.	
			5295		

(Continued on page 158)



QST BINDERS

Are your 1953 QSTs scattered around your shack? If so, get a QST Binder and file them away neatly for future reference. While you're at it, start the New Year right by obtaining another Binder in which to preserve those interesting 1954 issues to come.

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"Geo" HAMILTON, ONT. "Bill"

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Over 30 years N.E. Radio Training Center. Train for all types FCC operators' licenses. Also Radio and Television servicing. FM-AM broadcasting transmitters at school. Send for Catalog Q.

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HILLS VARI-SPEED



adjusts your rate of sending instantly. Merely push back the Vari-Speed arm to slow down or pull it forward to speed up. It stays in position. You don't have to slide anything nor fool with any thumb screws. A flick of your finger changes speed adjustment. (For example, from 18 wpm to 30 wpm.) Chrome plated.

\$1.50 postpaid anywhere in the U. S.

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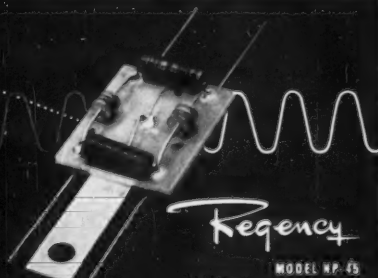
HERE IS AN EFFECTIVE HIGH PASS FILTER TO SUPPRESS TELEVISION INTERFERENCE!

The Regency Model HP-45 High Pass Filter is a constant "K" type filter with a cut-off frequency of approximately 45 mc. in a 300 ohm balanced line.

Attenuation at 29 mc. is approximately 20db. At frequencies of 14mc. and below, the attenuation is 40db. or more.

Signals above 55mc. are passed through the filter without loss.

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Here and There

R. J. McCormick, RM2, USNR (W0NHZ), is radioman stationkeeper at the Naval Reserve Training Center, Lincoln, Nebraska (K0NRL). K0NRL operates on the 80-, 40- and 20-meter bands and is at the service of any club or individual desiring tests or communication exercises. A standing invitation is issued to all amateurs to have a look around whenever they are in Lincoln. . . M. D. Randall, RMC, USNR (W1JBB) and C. J. St. Andre, RMC, USNR, radiomen stationkeepers at the Naval Reserve Training Center, Newport, R. I. (K1NRN), and Salem, Mass. (K1NAB), respectively, maintain a schedule on 3990 kc. Monday and Thursday after 1400 EST schedule. The Naval Reserve Training Center, Augusta, Maine (K1NAI), operated by N. Partidge, RMC, USNR (W1BWR), occasionally participates in the QSOs.

World Above 50 Mc.

(Continued from page 66)

W3NNV, Colwyn, Pa., hopes to be in business with 2-meter teletype before long.

W4FLW, Dresden, Tenn., reports the Weakley County AREC and RACES net operating each Monday at 2130 CST. Frequency is 50.35, and members include W4FLW, W4BML, W4HFO and WN4COY, who reports in cross-band from 3.7 Mc.

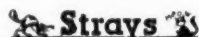
W5SCX, Ardmore, Okla., has a 6-over-6 2-meter array on a telescoping tower. It can be varied in height from 28 to 48 feet. Checks are being carried out with Dallas stations to determine whether there is any advantage in heights less than the maximum available. He reports new activity in Dallas, Waco and Hamilton.

W6CFL, Los Angeles, is back on his 2400-Mc. project after some diversion on 7 Mc. Tuck has compared two parabolic-reflector systems and finds that a 30-inch dish just outside the shack window is superior to a 6-foot reflector at the end of a 30-foot run of coax. For a field-strength indicator he used a crystal rectifier and pick-up antenna mounted on a wooden arm about 18 inches in front of the parabolic reflector that is ahead of the driven dipole. A 50-microampere meter is mounted in back of the dish, with a line running to the rectifier, to permit observations without getting into the antenna pattern.

W6CFL thinks that less than 20 OES appointees reporting regularly is a very small percentage of the total number of hams who must be interested in the experimental side of hamming. We agree — and we'd welcome additional members for the OES family. Your SCM, or we at Hq., will be glad to send full information.

W8WRN, Columbus, Ohio, is on 220.7 and 144 Mc., with modulation and keying system arranged so that he can change from one band to the other at will. He is working W8LGI regularly on 220, and has had several contacts with W8BFQ. On one occasion, Margaret came in stronger on 220 than on 144.

W9GFL, Green Bay, Wis., says that the N.E.W. (North-east Wisconsin?) V.H.F. Club is coming along nicely. A V.H.F.-U.H.F. Forum was staged on October 17th, with 110 in attendance. ARRL affiliation has been applied for, and an emergency net is now in operation. Many new stations are in various stages of completion. There's nothing like organization to get things rolling on the v.h.f. bands.



Stays

Talking about the parasites you ran out of the rig last night is all okay, too, but W1JRA, Amherst College Radio Club president, suggests organizing net-type rag-chews for the purpose of discussing interests outside radio. He'd like to see the formation of groups on 75 meters that would be interested in chatting about such things as music, literature and the like. If you have any ideas along this line contact W1JRA.

HAM-ADS

(1) Advertising shall pertain to radio and shall be of nature of interest to radio amateurs or experimenters in their pursuit of the art.

(2) No display of any character will be accepted, nor can any special typographical arrangement, such as all or part capital letters be used which would tend to make one advertisement stand out from the others.

(3) The Ham-Ad rate is 30¢ per word, except as noted in paragraph (6) below.

(4) Remittance in full must accompany copy. No cash or contract discount or agency commission will be allowed.

(5) Closing date for Ham-Ads is the 25th of the second month preceding publication date.

(6) A special rate of 7¢ per word will apply to advertising which, in our judgment, is obviously non-commercial in nature and is placed and signed by a member of the American Radio Relay League. Thus, advertising of bona fide surplus equipment owned, used and for sale by an individual or apparatus offered for exchange or advertising inquiring for special equipment, if by a member of the American Radio Relay League take the 7¢ rate. An attempt to deal in apparatus in quantity for profit, even if by an individual, is commercial and all advertising by him takes the 30¢ rate. Provisions of paragraphs (1), (2) and (5), apply to all advertising in this column regardless of which rate may apply.

(7) Because error is more easily avoided, it is requested signature and address be printed plainly.

(8) No advertiser may use more than 100 words in any one issue nor more than one ad in one issue.

Having made no investigation of the advertisers in the classified column, the publishers of QST are unable to vouch for the integrity or for the grade or character of the products or services advertised.

QUARTZ—Direct importers from Brazil of best quality pure quartz suitable for making piezo-electric crystals Diamond Drill Carbon Co., 719 World Bldg., New York City.

MOTOROLA used communication equipment bought and sold. W5BCO, Ralph Hicks, 204 E. Fairview, Tulsa, Okla.

SUBSCRIPTIONS, Radio publications. Latest Call Books, \$3.50. Mrs. Earl Mead, Huntley, Montana.

QSL's-SWL's Meade W0KXL, 1507 Central Avenue, Kansas City, Kans.

WANTED: Cash or trade, fixed frequency receivers 28-42 Mc. W9YIV, Troy, Ill.

QSL's, SWL's, High quality. Reasonable prices. Free samples. Write to Bob Teachout, W1P5V, Box Q124, Rutland, Vermont.

WANTED: All types of aircraft radio, receivers and transmitters. Absolutely top prices. Dames, W2KUW, 308 Hickory St., Arlington, N. J.

QSL's-SWL's, 100, \$2.85 up. Samples 10¢. Griffith, W3PSW, 1042 Pine Heights Ave., Baltimore, Md.

QSL samples. Dime, refunded. Roy Gale, W1BD, Waterford, Conn.

QSL's-SWL's, as low as \$1.50 per coil. Samples dime. Stronberg, P.O. Box 151, Highland Station, Springfield, Mass.

QSL's "Brownie," W3CJ1, 3110 Lehigh, Allentown, Penna. Samples 10¢, with catalogue, 25¢.

QSL's, SWL's, Fair prices for excellent quality cards. Eleven styles for you to choose from. Samples, 10¢. Almar Printing Service, 602 Barker Bldg., Omaha, Nebraska.

ATTENTION Bargain hunters! Dozens of real trade-in values including Collins, Vikings, Nationals, Hallicrafters, Elmac, Gonset, RME, Morrow, Harvey Wells. Write for free bargain bulletin. Complete stocks, all leading brands. We trade and sell on time. Burghardt Radio Supply, Watertown, South Dakota.

WANT QSTs older than 1920. Have 200 copies from 1932 to 1953 at 25¢ each. W0MCX Jablonsky, 1022 N. Rock Hill Road, Rock Hill 19, Mo.

DELUXE QSL's, Petty, W2HAZ, 17 Southard, Trenton, N. J. Samples 10¢.

QSL's-SWL's, samples, 10¢. Malgo Press, 1937 Glendale Avenue, Toledo 14, Ohio.

DON'T Fail! Check yourself with a time-tested Surecheck Test. Novice, \$1.50; General, \$1.75; Amateur Extra, \$2. Amateur Radio Supply, 1013 Seventh Avenue, Worthington, Minn.

QSL's, Something new, something different, samples free. CPS, Bladensburg, Md.

CALL Letters: 25 cents a set. Dress up your rig, car, etc. For samples, write to Robert Connick, Nickson, P.O. Box 272, Cincinnati 1, Ohio.

WANTED: Bargains in transmitters, receivers, laboratory and test equipment, power supplies, miscellaneous gear and parts. What have you? Please state price desired. Harold Schnowald, W5ZZ, 718 N. Broadway, Oklahoma City, Okla.

QSL's We've printed a million for hams all over the world. QSL's. Samples 10¢, refunded. VVS Print, 1704 Hale, Ft. Wayne, Ind.

QSL's, Taprint, 205 South, Union, Miss.

FREE List! New and reconditioned receivers, transmitters, etc. A hundred big bargains every month. Highest trade-in allowance. Fast four-hour shipping service. Special Novice department. Write us today. Dossett, W9BHV, 855 Burlington, Frankfort, Indiana.

QSL's? QSL's? Get America's finest and largest variety super gloss QSL samples, 25¢. One-day service. Sakers, W8DED, P. O. Box 218, Holland, Michigan.

SWAP only. Any 15 copies of QST 1917 to 1921 for March and May 1916 issues. Have 100 copies QST 1933 to 1946 at 25¢ each. Jablonsky, W0MCX, 1022 N. Rock Hill Road, Rock Hill 19, Mo.

MICHIGAN Hams! Amateur supplies. Store hours 0800 to 1800 Monday through Saturday. Purchase Radio Supply, 605 Church St., Ann Arbor, Michigan. Phones 8696 and 8262. Roy J. Purchase, W8RP, Leroy Reichenberger, W8LJD, Edmund E. Gunther, Jr., W8HWW.

VAN SICKLE has Eldico, Sonar, National, Hallicrafters, Hamerlund, Elmac, Gonset and Johnson-Viking in stock at lowest prices. "Gene" W9KJF, Van Sickle Radio Supply, 1320 Calhoun, Ft. Wayne 2, Ind.

WANTED: BC-348 receivers and parts. Write to James S. Spivey Co., 1406 "G" St., N.W. Washington 5, D. C.

BIRTH Announcements, ham-styled 25 for \$1. Carl Narvestad, Granite Falls, Minn.

POSTCARD brings you free information on our new Amateur Desk Signs and money-saving club purchase plan. Hawkins Distributing Co., Paquetuck Terr., East Moriches, N. Y.

BARGAINS: MD-7/ARC-5 modulators, \$5.95; RT-19/ARC-4 transceivers (2 meters) with xtals, \$39.50; T-30 throat mikes, 69¢; screen mod. xfrmer BC-456, 95¢; ARC-5 plugs, \$5.42; 35¢; #5577, 35¢; PL-154, 70¢; PL-154A, 70¢; #7027, 45¢; #7025, 45¢; PL-152, 65¢; C-30/ARC-5 control boxes, \$1.65; BC-434-C compass, used, excellent, \$32.50; Circuit breakers: 500 Ma at 1000 VDC, \$2.25, 10 Ma. insulated for 5000 V, \$1.95. Many other items. Send M.O. or check. Shipping charges C.O.D. World Wide, 88 Cortland St., New York 7, N. Y.

WANTED: AN/ART-13 transmitter and/or parts. Robert Wegelin, 410 Cedar Street, NW, Washington, D. C.

TV set, 10 in. and 12 in., excellent condition, also Webster wire recorder and Ampco tape recorder, like new. Sell any or all, cheap or swap for good camera. W2FUB, S. Colin, 80 20 126th St., Kew Gardens 15, L. I., N. Y.

SELL new 1625 tubes, same as 807 with 12-volt filament, 97¢ each, plus 1¢ postage. W71BE, 318 W. Galer, Seattle, Washington.

MOBILEERS! CD Men! New PE-101C Dynamotor converts easily to mobile supply unit: output (with 6VDC input): 160V at 110 Ma, plus 300V at 90 Ma. Output (with 12 VDC input): 610V at 150 Ma plus 325V at 125 Ma. Brand new PE-101C complete with conversion data: \$3.75. Send money order or check. Pay shipping charges on delivery. "Communications," 111 Liberty St., New York 7, N. Y.

WANT: AN/ARC-1's, AN/ARC-5's, BC-610E's and components. Write to B. Spivey, 7013 Rolling Road, Chevy Chase, Md.

QSL's-SWL's, Bartoski, W1VHD, Box 617, Houlton, Maine.

QSL's, High quality, samples 10¢. Dortch, W4DDF, Jocelyn Hollow Rd., Nashville, Tenn.

VIKING II, wired model, Johnson VFO, Rahus, \$300. W8DXR, 1511 Woodview, Hamilton, Ohio.

"DX Log of Awards," the information you have been looking for. Contains the official rules for more than 30 awards with check lists to record your progress. DXCC covers nine pages alone on 8 1/2 x 11 pages. Only one non-DX award, WAS. Contains also postal data, countries cross-index, list of banned countries and other valuable information. The prepaid price to any country only one dollar. U. S. funds. Write for price if to be sent by Air Mail. Ed. Frierson, W4RKL, Holby Publishing Co., Eatons, S.

QSL's, Samples free. Allertson, W4HUD, Box 322, High Point, N. C.

BRUSH BK-400 "Soundmirror" Tape Recorder, Brush BA-106 Microphone, pushbutton control, 9-tube amplifier, \$85; Econ 7 1/2" speed, 2" reels, dual track, \$85; Garrard RC-80 Three-Speed Record-Change, new, original carton, \$37.50; Garrard RC-60, GE Pickup, \$17.50; Ruder Chantrel 162¢; \$65, Collins FM-11 Tuner, \$45; York Saxophone, \$25; Electro-Voice 950 "Cardak" Microphone, \$20; Sonora Portable Radio, 110; Coronado Portable, \$10; Tru-tone 3-way, \$15; Zenith 3-way, \$15. All sold on money-back guarantee. Priced FOB V. R. Hein, 418 Gregory, Rockford, Illinois.

SURPLUS radio parts and tubes cheap. Send for list. Atlanta Electronics, Box 2091, Atlanta 1, Ga.

SELL, 80 amp 6 volt Auto Lite generator and regulator \$50 (very low cut in speed). 02 Henry 10 amp chokes (very heavy duty) \$15 each, 60 foot plymold Sig Corps mast, nests to 10 feet, \$20; Gonset Tri-Band, \$25; Lysco 10 meter transmitter, \$15. Want 12 and 24 volt generators and batteries. Chas. Ham, W2KDC, 200 Harvard St., Westbury, N. Y.

SALE: Mobile station, 10-20 Meters, Sonar MK-3 receiver, Bromoco 50 watt transmitter, PE-103, Master Mobile antenna, mount, Shure 101C "Koildor" mike, crystals, relay box, cables, extras, complete \$225. R. F. Bilson, 60 Elizabeth Dr., Bethpage, L. I., N. Y.

SWAP: Plectrum Guitar, built-in pick-up. In beautiful condition. Cost \$200. Exchange for xmitter or receiver. W9QMG, 9505 Seminole St., Silver Spring, Md.

SELL: Going overseas. Factory wired Johnson 1 xmttr, Johnson VFO, B & W 52 ohm low pass filter, SX 71 Rec. Matching speaker, extra and new, 4D32, consider best offer above \$400 prior 10 Jan. W4CEM P.O. Box 575, Q. M. School, Ft. Lee, Va.

COLLINS: 32V-1 with B & W LP filter and spare 40132 for local sale, \$400. Perfect condition going on VHF. Also RHer used few hours, 10M coil, \$15. Dynamotor input 6v output, 425v-175ma, \$15; BC-696A with all tubes not modified, 3-4 Mc, \$15. Jim Gam-mill, 201 John St., Monterey, Calif.

COLLINS 310B-1 excellent condition, \$200; 2 BC-455 (6-9 Mc); BC-454 (1-6 Mc) new condition, \$12 each. W6CPL/4 Clinton Barrick, 903 Moyle Dr., Falls Church, Va.

FOR SALE: 11Q129X, speaker and atal calibrator \$140. BC-455, 85 kc 115 47262 new, \$1.50 each, QST Jan. 37 to Jan. '53, less 49¢ and Mar. '51, best offer All plus postage. M. J. Marshall, 455 Washington Ave., Dumont, N. J.

FOR Sale: Late model HRO 50, coils from General Broadcast to 31 Mc, atal calibrator, speaker, all like new in original container. W9LQI, Faust H. Boyd, Ashton, Ill.

SX-62 and R46, perfect condition in factory cartons, \$275.00; TBS-50D and APS-50, excellent, used 1 month, \$140.00. WSWTV, Box 1054 N. St., Natchitoches, Louisiana.

COMPLETE mobile short wave gear for one-half of original cost. Elmac transmitter, Tri-band converter, all associated equipment, nothing else to buy, used very little. S. Popp, Suprsvr., WIL, Hotel Chase, St. Louis 8, Mo.

TRADE: Western Electric 124-J Amplifier with preamp, 754-A loudspeaker in cabinet, want ham receiver, Trade 3 HE29A, 80' Belden 8432 dual shielded, want ham gear. T. H. Mackintosh, WAMG, Elon College, N. C.

WANTED: U.T.C. VM-4 modulation transformer, State price, WIGKK, G. L. DeGrenier, 109 Gallup St., No. Adams, Mass.

FOR Sale: 522 Transmitter Receiver, \$45.00. 1-M-10 Frequency Standard with book, \$85.00. Model 12 Teletype Printer, table, cover, converter. Ship F.O.B., W71RE, 318 W. Galer, Seattle, Washington.

LYSCO 600PS: Transmitter, one year old, TVI, VFO, with Lyco model 50 antenna coupler and coax, and complete instructions. All perfect condition, \$175.00. Ted, Tallmadge, W9WLV, 2729 E. Capitol Drive, Milwaukee 11, Wis.

FOR Sale: 165 watt Globe Champion Transmitter, Phone-CW, 10 meter coils, \$150.00. Tex, Dallas, 233 W. Broad St., Tamaqua, Pa.

TVI Monitor, compact 7" set \$15. Larger screen, \$40. Want Elidco or Multiphase SSB Exciter, W4AFL, 1420 South Randolph, Arlington, Virginia.

SWAP: Astronomical and other books for ham equipment. Write for free list. James E. Brugh, 400 Whitney Ave., Pittsburgh 21, Pa.

GONSET Commander mobile transmitter with VFO, like new. Works perfectly. \$100.00. W1VDA, Schmidt, P.O. Box 1225, Harrisburg, Penna.

75 WATTS to pair 1625's on 80 and 40 meters. Yours complete with power supply, tubes, coils and crystals, \$45. F.O.B. Eico Sweep generator, model 1015, \$15. Hallcrafters S-53 Receiver, excellent condition \$75. Old style Master Model Antenna coils for 75 and 20 meters with chrome shield, both for \$7. W4BIW, 751 San Antonio Drive N.E., Atlanta, Ga.

NOVICE 75 watt cw rig, \$15.00. 1625, 1626, 1629, 35c each, \$32, \$5.00. 808, \$10.00. Donald Vaughan, W4M1V, 26 Peachtree Hills Ave., N.E., Atlanta, Georgia.

FOR Sale: 32V-1, with set of spare tubes, \$400. TBS-50C, \$75. Morrow 3BR, \$35. Howard 660 Frequency Monitor, \$15. RCA KW modulation transformer, \$15. AVI-112A transmitter, \$25. BC 610 exciter tuning units and miscellaneous gear. W7KVF, Box 215, Laramie, Wyoming.

M1 XMI #120, custom made, wooden, "living room" cabinet \$65, twelve drawer steel parts cabinet, crammed 220, assorted valuable parts for high power rig \$20. All for \$200. K2CJDO, Ross, 37 Ridge Place, Neptune City, New Jersey.

WANTED: one xtal mike and desk stand, W3WCW, 32A Glenwood Rd., Baltimore 21, Md.

SELL: 75A2 FM Adapter, xtal calibrator, speaker, like new, first check \$300 shipped express collect. Quan 1500 watt 110V 60 cycle gasoline generator \$125. Elidco antenna scope new, \$12.50. Polaroid Camera model 95, with all accessories, \$75. W4IWA, George A. Cottrell, 1602 Morrison Drive, Lynchburg, Virginia.

WANTED: HQ120X or HQ129X, W9RIA, Hoosier Cts. 15-2, Bloomington, Ind.

UNUSED, factory wired, complete 150w. phone-cw transmitter \$119. Chris Lane, North St., Harrison, N. Y. Rye 7 0114, K2DQH.

ARR-5 RCVR 27-141 Mc, AM-FM-CW. Excellent condition \$35. Will deliver Chicago area. W9PQE, Bill Nielsen, 1722 E. 70th St., Chicago 49, Ill.

CANADIANS! Write for list of equipment for sale including HT-9, SX-42, Gonnet Tri-band, Crabtree, VE2AJ, 765 118th St., Shawinigan South.

MILWAUKEE: Ham! Resulting from home cleaning have a lot of good equipment for sale including kilowatt transmitter receiver power supplies and parts. Card to Box 703, Elm Grove, Wis. for list.

TRADE: KW power supply with Thordarson T21P77, two section filter, 2500 VDC @ 400 ma. KW RF amp with 4250A. Wanted: large calibre hunting rifle in excellent condition, other hunting and camping equipment. Write to F. R. Tesche, WSUZI, 2113B 48th St., Los Alamitos, New Mexico.

BENDIX LA-12 Transmitter, BC-454, 12 volt Batteries, Hallcrafters SX-42, Cables, 4 connectors, 25 watt Resistor, S8 Gonnet Wire Recorder, 78-35 Green-Flier Turntable (in portable case), misc 24 volt generators, 1.81 F. Radio Compass Indicator, T21P1 Selys generator, 807 Mod-Frma Zenith Broadcast Revr, Airline Broadcast Revr, Bath-Tub Condensers, Ceramic Condensers many sizes. Make offer on above. Donald B. King, W8GU, 18944 Sorrento, Detroit 15, Michigan.

RIDERS Manuals Vol. One through Sixteen. All unused except vol. Ten. Beat offer cash or trade for right receiver. Dick KH6ARE, 236 Aunroe Rd., Lakeland, T.H.

NOVICES: Phone/CW Mark II Transceiver, 2-8 Mhz., converted to AC, \$39.50. EER JA 9 0904, 133-08 135 Place, South Ozone Park, NYC, N. Y.

JOHNSEN Viking II for sale, with tubes, wired, new, WINHM.

T2FD Antenna resistor 350 or 400 ohm, 250 watt, \$1.98. Full wave rectifier and transformer combination delivers 28 VDC/12 Amp, \$29.98. Mallory Inductantuner 4 gang signal 52 to 216 Mc's, \$2.98. We buy & sell & swap as well. "TAB", 111 Liberty Street, N. Y. C.

SELL: Collins 32V1, modernized at Collins factory, like 32V2. In excellent condition, spare 4D32. Prefer local deal. Will ship F.O.B. for \$400.00. W8QMN.

YOUR favorite QSLs. Photos, Licenses, permanently sealed in plastic, preserved and protected forever, 2 1/4 x 3 1/4, 50¢; 4 x 5, \$1.00; 5 x 7, \$1.50. Quantities five or more, special 25% discount. Dependable, fast service. Cra Plastics, Box 89, Warwick, Virginia.

SELL: Hallcrafters SX-71 with speaker (not regular R-46) and Select-O-Jet (kit constructed). Good operating coils but does need alignment. Beat offer over \$155, plus shipping charges. All inquiries answered. Nickerson, WIRWD, Box 1832, New Haven 8, Conn.

FOR Sale 10 meter transmitter 25 watts size 8-B-7 cabinet ideal for mobile 6V6 omc, 2E26 final 6V6 Heising Modulator complete with power supply and mike \$30.00; 30 watt modulator class A-B 6S17-615-616 all new component parts with heavy duty modulation transformer, price, \$30.00. National 6 volt vibrator power unit, type F205 1. Price, \$10.00. Gupta, 17 Park St. Ct., Medford, Mass.

WANTED: Collins 32V-1, W4CPO, P.O. Box 2423, Norfolk, Va.

SELLING out: complete station, SX-43 Hallcrafters receiver, 120 watt all band phone transmitter with VFO exciter built in 37" Bud cabinet with 10-104 mike. Photo on request. \$150.00 F.O.B. Richmond or sell separate. James R. Driver (W4ZRS), 6419 Fitzhugh Ave., Richmond, Va.

FOR Sale, Collins VFO, Instructograph Senior, BC 221, 453, 454, 457, 459, 606, 624 and 625. Stamped addressed envelope brings full particulars. W3VCN, Winton, Md.

SELL or Trade: 810's, 813's, PE103, oscilloscope. Other tubes, parts. List on request. Want antennacore. W8SYA, 2619 So. Gaylord, Denver, Colorado.

WANTED: Used No. 5527 Icnoscope Tube. State your price in first letter. Paul White, Jr. W9WNU, 1536 George St., La Crosse, Wis.

VHF Sale: SCR-522, electronic squealch, unmodified, ready for immediate service in any aircraft or ground rig. With it, complete power supply, except function of channel changing which can be done manually. Connectors included. Hardly a scratch and perfect condition. Make offer to: John G. Schmid, QNSI, Radio M3, Seven Islands, Que.

WANTED: PE-103 new in original carton, Jerry Lacks, 8146 Cannon St., St. Louis 24, Mo.

PHYSIST—Specializing in antenna design and analysis. Writing ability desirable. Permanent position in excellent location. Advancement commensurate with ability and results. State qualifications, salary desired, and availability in first letter. Telrex, Inc., Box 879, Ashbury Park, N. J.

MOBILERS: Improve selectivity, state model of auto radio, \$15.95. Green Electronics, 8-01 149 St., Whitestone, L. I., N. Y.

FOR Sale: A-1 General Radio Hetrodyne Frequency Meter and Calibrator Type 620-A Coverage 300Kc to 300 Mc accuracy 01%, Will accept GR 724-A or B model wave-meter as part trade, W3BRV, 1157 Hill St., York, Penna.

FOR Sale: Elmac A-54 with 40M. Like new, \$120. Richard Pippert, Dysart, Iowa.

JOHNSEN Viking II transmitters kit form, \$279.50; wired and tested accordance factory specifications, \$319.95; modified for remote control operation like the 32V series, \$334.95; modified for 4D32 final in lieu of 6146s, \$339.95; with 4D32 and remote control features, \$354.95. Viking VFOs, wired and tested, \$54.95; we trade and offer terms. Write Carl, W1BFT, Evans Radio, Concord, N. H.

10, 15 & 20 METER BEAMS, Aluminum Tubing, etc. Perforated Aluminum Sheet for shielding. Radcliff's, 1720 No. Countyline St., Fostoria, Ohio.

WANTED: Collins 410B-1 or 410B-3. Please advise price, condition, and modification if any. Box 3941, Victory Center Station, North Hollywood, Calif.

SELL or trade I2 Cont HIA, Weston Master, Ampio Stylit, like new with cases, Bandmaster Deluxe, DPS-50, 600D microphone. Want 75A2 and 32V2 or Viking II kit or factory built. Captain R. J. Finkerton, HMB 261, Cherry Point, North Carolina.

FOR Sale: Underwood typewriters, Remington typewriter. Trade: late model Underwood office typewriter for Harvey Wells DeLuxe or Globe Scout. G. Samokofsky, W2YSF, 527 Bedford Ave., Brooklyn 11, N. Y.

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HALLCRAFTERS S-38B good condx \$30; Philmore 80-10 Meter XMITR with power supply 25 watt input, P.V. net \$20; Wanted: used receiver and 20 meter four CW XMITR. Reasonable, Fred Schwartz, 2825 West First St., Brooklyn, N. Y. — K2BYX.

CODE slow? Try new method, Free particulars, Donald H. Rogers, 41 Fourth Street, Fairwood, N. J.

FOR Sale: Dynamometers, 6v. Carter VSE610, new armatures, 600 v. @ 300 ma. N. G. Denton, 755 Cajon St., Redlands, Calif.

QSTs, in excellent condition: 1940-1943. A few missing. Make an offer. Mrs. James Gwynn, 2225 Grand Ave., Des Moines, Iowa.

WANTED: New or new like B.C. 455 with tubes in good working condition. 110V AC power supply and tuning knob desired but not absolutely necessary. State price. Paul Powell, W8RPF, 801 Matamoros St., Laredo, Texas.

SELL: BC-619 and 110V RA42 Power Supply; SX-27; TS 121 with or without 110V supply; two 4501H with FIL. X-FMRs; BC614D ART-13, DY-17, remote control unit, all complete with racks, plugs and cables, incl. 70-100 Mc FM X-MTR and receiver; write enclosing bid to W7NVN, 555 So. State, Salt Lake City, Utah.

RJ-4D32 tube, brand new, \$19.50 postpaid. WSAXL.

SELL: BC610F, BC614E SA. Excellent condx. on caster base. TVFSD. Via OST May 1951. Coils 10-20-40-75. Prefer buyer to pick up extra 250th mic. others. \$500.00. W8CRH, Box 101, Evert, Mich.

SELL: 4-125A, 20 meter 500 watt coil. Write for prices. W4WSF, 244 Parkway, Winchester, Va.

FOR Sale: SX-71, like new, \$175 or best offer. Want Magnacord tape recorder, Rolodex, Morrison, 2600 Ridge Rd., Berkeley 9, Calif.

WANTED: Thordarson T-670. Write Jim Doyle, W7UTY, KCKY, Coolidge, Arizona.

SELL: OST 1912 to 1950. Lacking 4 issues in 1912 and 1914 and July, 1945. Tech-Master Model B-15 AM Tuner new with mahogany cabinet, \$10.00. Lyco Model 401, Clamtube Modulator new condition, \$10.00; Drake TV 300-10HW low pass filter for 300 ohms for 10-11 mhz, \$4.00. E. Mattison, W8JFS, 428 S. Charles, Lima, Ohio.

HARVEY-WELLS TBS-50C, with AC power supply, coaxial antenna relay and carbon microphone, all like new, \$10.00; Gonnet Super SX converter, \$42.00; Electro-voice 600C dynamic microphone, \$10.00; 0-100 R.F. Milliammeter, \$9.95; 0-100 D.C. Voltmeter, 0-100 D.C. Milliammeter, \$1.00 each. Write Ed Matthews, W4ZMZ, Charleston, West Virginia.

WANTED: ART-11, ARC-3, TCS, BC-348, used receivers, transmitters. Part Electronics, Box 273, Lexington 73, Mass.

TRADE: NRI Communications Course, 78 Lessons for Good Electronic Key or \$30.00. Miller, WLSR, Park Falls, Wisconsin.

FOR Sale: National NC-181 and Hallicrafters R-46 speaker both 52 models, tops in appearance and operation, original cost \$299.00. Must sell, asking \$185. D. Reals, W2MPB, 210 Jewett Ave., Buffalo 14, N. Y.

CLEANING house. Parts either brand new or used only slightly. Will sell dirt cheap. Postcard will bring list and prices by return mail. J. A. Beralde, 342 Gault Drive, Ft. Monroe, Va.

FOR sale complete mobile Stanco ST203A, Conset Super six converter, chipper, dynamotor supply, cables. Best offer. Morris Rosen, W2KNP, 240 First Ave., N. Y. C.

SAN FRANCISCO or vicinity. Complete station: 35 watt CW phone, 80 thru 10. Hammerlund 4-20 transmitter, 4-11 mod. receiver, S40, preselector, control panel, desk included, like new. \$200.00 takes all. V. Terrullo, W6PFX, 41 Redlake Ave., San Francisco, California.

SELL: Viking II late model. Home-made VFO. NC57 Rec. G. Johnson, W0PJ, Knoxville, Ia.

IDEAL Antenna coupler. Feeds beams, folded dipoles, long wires interchangeably. Inexpensive. Simple. Plans, one dollar. W4PVD, Cookeville, Tenn.

SWAP: Super Pro 400X, Graflex View Camera 7.7 aluminum. Never used, Rolleiflex 3.5 f/9, want 75A. Bill Boyce, W2HRI, 23 Hamilton Drive, Caldwell, N. J.

ANTENNAS. Specializing exclusively in amateur antennas. Greene dipoles and 20-meter Panther beams. Send for flyer. Antenna, Inc. Wakefield, R. I.

FOR Sale: 20 meter, 3 element, "F" match, HyLite Beam, \$50.00 or best offer. F.O.B. Roger Aden, W9UZP, Golden, Illinois.

QSTs for sale. Bound volumes 6 (Aug. 1922 thru July 1923), 7 (Aug. 1923 thru July 1924), and volumes 9 thru 28 (1925 thru 1944). Excellent price on the twenty-two volumes. L. A. Morrow, W1VW, 99 Bentwood Court, West Hartford 7, Conn.

FOR Sale: Push-pull 250W11 KW final and power supply. B&W tank. Coils for 20, 40. Complete with tubes and meters. Will take highest offer. F.O.B. Suffolk, Va. T. B. Cutchin, W4TBC, 113 Chestnut St.

FOR Sale: 3-Mark II transmitters/receivers untouched, 750 watt 110 volt 60 cps gas engine generator, BC-221 AH with chart A-1 shape, transformers, clocks, meters, 811, 810, 815, 809, 1041 L, etc. 500 watt antenna tuning unit 2 RF meters ARC 5 Rcr., PE103, 288X Hickok Sig Gen, Precision EV10 with HV probe, etc. Send for list and bargains. Radio, WBBW, B.L.A. P.O. Box 722, York, Pa.

BARGAINS: Extra Special: Motorola P-69 series Mobile Receiver, \$19.50. Conset 10-11 converter, \$19.95. DM-36-10 mobile converter, \$19.50. VHF-152, \$49.00. Breting 12, \$49.50. HF-10-20, \$50.00. S-40A, \$75.00. RME-45, \$99.00. RME-211, \$99.50. HRO senior, \$99.00. SX-41, \$119.00. S-76, \$149.00. SX-71, \$169.00. SX-42, \$189.00. HRO-50, \$275.00. 75A1, \$275.00. MB611 Mobile Transmitters, \$14.95. 9080 exciter, \$22.50. HT-17, \$32.50. EX Shifter, \$69.00. Globe Trotter, \$69.50. THS-50D, \$99.00. HT-9, \$199.00. Supreme AF-100 or Tenon 750A, \$225.00. Globe King, \$295.00. We need used receivers: We give highest allowances for S-20R, S-40A; B, NC-57; NC-102; SX-24; SX-25; HQ-129X, and similar receivers. Free trial. Terms financed by Leo, W6PQ. Write for catalog and best deals to World Radio Laboratories, Council Bluffs, Iowa.

NEED: NC-348 and BC-342 radio receivers. C. Hoffman, 1406 G St., N.W., Washington, D. C.

PLANNING: SSB? New (surplus) crystals type FT-241-A matched sets 2- and 3-digit series for any published circuit, new price, \$1 per crystal. Special for serious SSB workers: Weaver-Brown (Aug. 51 OST) lattice set 8 crystals custom-worked to guaranteed 15 cps or better accuracy, \$20 the set, 5 cps or closer, \$50 the set, inquiries invited. All crystals postpaid. Calif. buyers add tax. Orco Products, Box 51, Downey, Calif.

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WANTED: Complete sets or parts for wireless set 19 MK II or III. Advise best price and condition first letter. Also: BC 6295.00, with speech amplifier. Send full information first letter. Montgomery, 715 Varma Ave., North Hollywood, Calif.

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WANTED: Surplus (for amateur) receivers, transmitters, test equipment, teletype, Loran, Radar, Manuals, in trade for New Johnson Viking, Hammarlund, National, Harvey Wells, Conset, etc. Alltronic, Box 19, Boston 1, Mass. Richmond 2-0048, 2-0916.

SELL: SX-71 receiver used one year and completely realigned for improved sensitivity. Like new condition, \$175. Thor Lyford, W0JIK, Waseca, Minnesota.

REQUEST free detailed listing, complete descriptions: National NT-200, speaker, \$75; Hallicrafters 3-40-A, \$65; HT-17, all bands, \$45; Panadaptor PCA-21-200, \$90; Meissner shifter, \$32.50; Millen Grid Dipper, \$47.50; BC-221-AH, \$67.50; BC-221-C, \$75; 52 ohm 10-pass filter, modulation indicators, Triplett 1696-A; Lambda MM-2 Set; Sylvania X-7018, pair; BC-611 Hand-Held talkies; batteries; RCA AVF-112 transmitter; TS-10-G sound powered handsets; BC-455, power, speaker; BC-454; BC-455; Command transmitters 7-9-1, -4-4, 1-3-2-1, meters, tubes, crystals complete SC-R-522 two meter station equipment, many other items, bargains. Everything new or like new, technical information, F.O.B. Indianapolis. Howard Severed, W9DPL, 2431 East Riverside Drive, Indianapolis 23, telephone Winthrop 8184.

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TOP cash for your receiver. Electronic Labs, 2444 "D," Lincoln Nebraska.

FOR Sale: Collins 32V2 and 75A2 perfect condition, spare 41D32 included, \$750. F.O.B. Richmond, Va. "Larry" Arnold, W4JOT, 4900 Riverside Dr.

SELL: Teletype #21A modget printer, \$49, #12 Typing unit, \$50, 7-B tape transmitter, \$25, Wheatstone polar relay, \$12, Panadaptors: APA-10, \$125; REB, \$85; BC-1032A, \$88; AR-88-F Diversity Receiver, \$250. WANTED: ART-11, APN-9, BC-348, BC-342, BC-112, CU-25, ART-13 antenna, loading coil, 32V-1, 32V-2, 75A-1, 1-M, BC-221, manuals, sig catalogs. Will buy or trade. Tom Howard, W1AFN, 46 Mt. Vernon St., Boston 8, Mass. Richmond 2-0916.

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COLLINS 75A3 brand new in carton, \$475. WIERN, 14 Emerson St., E. Norwalk, Conn.

FOR Sale locally. National NC-125 receiver. Brand new, \$125. M. Smith, W2NYE, 832 Belmont Ave., Brooklyn 8, N. Y. or call AP 7-0760 week ends.

WANTED: Any complete and perfect, or complete and excellent membership copies of QST published in period 1919 to 1925, inclusive. These contain operating or Traffic Department Reports. Also want Special Leaflet published May 1920, entitled "Operating together Again," sometimes called "Midget Issue of QST." Sumner B. Young, W0FO, R.R. 5, Box 94, Wayzata, Minn.

MILLEN: R-9r preamplifier. Complete with 27-32 mc plug-in coils. Perfect condition. Shipped anywhere in U. S., \$18. "Bob" Tetradit, W1UPN, 28 Lucas Street, Portland, Maine.

WANTED: Early wireless gear, books, magazines and catalogs, before 1925. W6G-H, 1019 Monte Drive, Santa Barbara, Calif.

WANTED: 400R transmitter. Please state condition and lowest price. H. Cushing, W1EUS, 16 Preston Drive, Manchester, Conn.

SELL: 40 watt modulator, push-pull 807's AB1 with Universal transformer and built in power supply, similar to that described in May 1951 QST. Best offer. Charles H. Willard, W2E2B, 1412 Onida St., Utica, N. Y.

SX-71, like new, \$150. BC-459, unmodified, \$15. SC-R-625 mine detector, complete, \$35. New F-15/U 2KV low pass filter, \$5. Few new BC-366 rack boxes, 50¢ each. Wanted AR-14 transmitter and parts for same. Al Kujama, W1KJO, 29 Pine St., Bedford, Mass.

HALICRAFTERS SX-28, speaker, cabinet, \$120. 75w. cw xmit shown Oct. 51 OST. No doubler. Can easily be added. Lo pass filter, ant. tuner, excellent, \$65. Instructograph oscillator, tubes, etc., complete \$40. RCA 4-000 code practice set, \$8. Frank Connelly, 1018 Pawnee, Wilmette, Illinois.

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If I wanted to trade anything, I'd see Uncle Dave, W2APE, at Port Orange Radio Distributing Co. in Albany, N. Y.

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WANTED: BC-348, \$110, BC-348L, H. K. \$90, also APN-3 and CPN-2 equipment. Radialyn, Inc., 87-17 124 St., Richmond Hill 18, N. Y.

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TRADE: Automatic Rolleiflex, 13.5 coated, Heiland Synchronizer and complete multiple flash equipment, Hartley field lens, case, lens shade, Quikset Sr. Tripod, Weston Master II exposure meter, filters, etc. All like new. Cost over \$420. Want Collins 75A Receiver in same condition. Local deal preferred. W2VZT, "Ernie" Palukas, 335 E. 69th St., New York City 21.

FOR Sale: HT-9 transmitter, perfect condition, coils 40 & 20, spare 814, instruction manual, grey crackle, untampered, \$195. F.O.B. Buffalo, N. Y. W2VMO, N. C. Kellerman, 5 Sandrock Road.

SELL or Trade: 45 watt 75M mobile transmitter, 6V dynamotor, Conset Tri-Band converter. Ralph E. Queen, Route 7, Spartanburg, S. C.

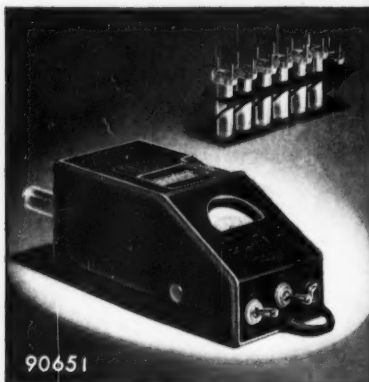
SELL: BC-453-B (Q5-er), BC-454-B, A.C. power supply for either receiver, \$5 each. Ross Moorhead, Route One, Findlay, Ohio.

FOR Sale: New BC-375E with tuning units. Merlin Schumacher, Lomira, Wis.

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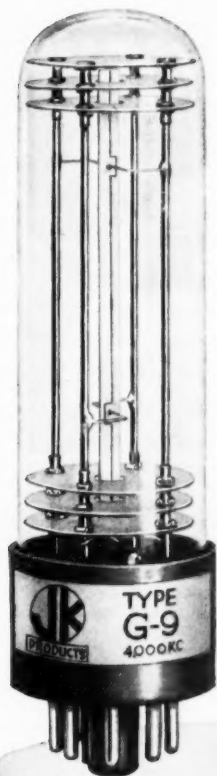
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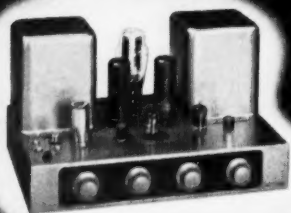


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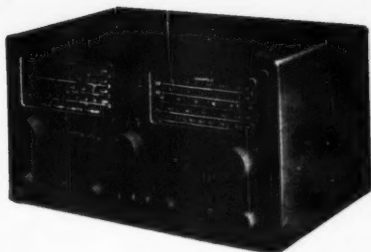
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